



PORT MANAGEMENT SERIES

Volume

1

Port Management Case Studies

2011 - 2013 Cycle of the TrainForTrade
Port Training Programme

English-speaking Network





PORT MANAGEMENT SERIES

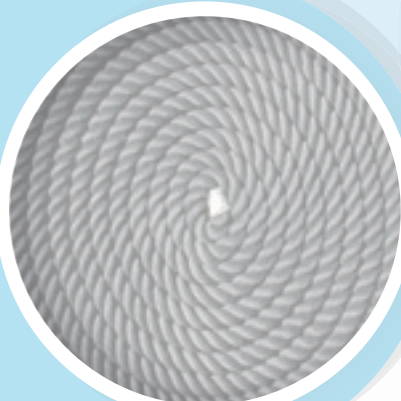
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NOTES

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INTRODUCTION

UNCTAD assists developing countries in their efforts to integrate into the world economy on an equitable basis. In the area of trade, the focus has turned towards the reduction of non-tariff barriers and trade facilitation measures. This is because barriers, such as long waiting times at borders, inappropriate fees and cumbersome administrative procedures, constitute obstacles for trade that are as serious as tariff barriers. Consequently, UNCTAD is committed to assisting developing countries as they carry out these complex, behind-border measures, which include broad institutional and regulatory reforms as well as specific actions aimed at improving port efficiency, for example.

Port efficiency is important for trade facilitation because ports are the main entry and exit points for international trade. In volume terms, nearly 80 per cent of world merchandise transits by sea. For many developing countries, this figure surpasses 90 per cent. Port efficiency therefore has a direct impact on the ability of a country to participate in international trade. It follows that ports serving developing countries must operate efficiently for them to integrate into the world economy effectively.

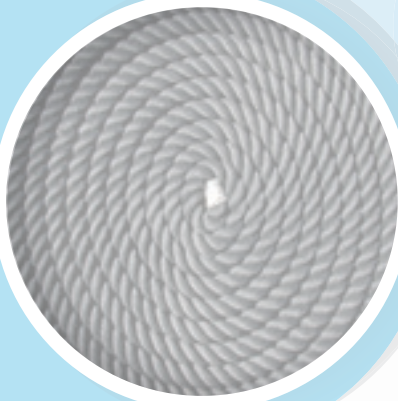
UNCTAD assists ports in developing countries by conducting research, carrying out technical assistance activities and providing training and capacity-building. The TrainForTrade Port Training Programme strengthens talent management and human resources development in ports in developing countries by setting up a sustainable capacity-building

framework for training future managers. It also creates port networks, bringing together port experts from public and private entities from around the globe to share knowledge and expertise, and to capitalize on research conducted through the programme with regard to port management and port performance indicators.

A key component of the programme is the dissertation process. Participants work with senior managers in their ports to conduct research on a specific problem faced by the port and propose feasible solutions. The dissertation process requires that the participants put into practice what they have learned and allows them to immediately contribute to improving operations in their ports. Upon completion, the participants defend their dissertations before panels composed of senior managers from their respective ports, as well as senior managers from other ports that are members of the programme and representatives of UNCTAD.

This publication presents the dissertations from the past cycle of the English-speaking network of the TrainForTrade Port Training Programme (2011–2013). The document is structured in two parts. The first chapter gives background information on the Port Training Programme, in particular the English-speaking network, and explains the dissertation process. The second chapter focuses on the results of the research done by the participants and provides summaries of the best three dissertations from each member country: Ghana, Indonesia, the Maldives, Namibia and the United Republic of Tanzania.

CHAPTER I:
**BACKGROUND
INFORMATION**



A. A BRIEF HISTORY OF THE ENGLISH-SPEAKING NETWORK

Established in 1996, the UNCTAD TrainForTrade Port Training Programme supports port communities in developing countries in quest of efficient and competitive port management. In order to increase trade flows and foster economic development, the Programme creates port networks bringing together public, private and international entities. The aim is to share knowledge and expertise between port operators and strengthen talent management and human resources development in port communities. The first network created was for French-speaking port communities in Africa.

In June 2007, the International Coordination Meeting of UNCTAD's Port Training Programme for English-speaking Port Communities in Developing Countries was held in Dublin, Ireland. Some 60 representatives from Africa, Asia and Europe attended the conference to examine all aspects of establishing future cooperation among the ports in the framework of the UNCTAD TrainForTrade Port Training Programme. The delegates adopted the Dublin Declaration, recommending the implementation of the Programme in English-speaking port communities in developing countries in Africa and Asia.

UNCTAD and the Ministry of Foreign Affairs of Ireland signed an agreement in November 2007, granting financial support for the UNCTAD TrainForTrade Port Training Programme for English-speaking Port Communities. The pilot project was composed of two main phases: the first phase consisted of fact-finding missions in the potential pilot countries to determine specific needs and priorities; the second phase was the implementation of the Programme in five selected port communities in Africa and Asia. This pilot project, also financed by Dublin Port Company, began in August 2008.

At the end of the pilot phase, an International Coordination Meeting was organized in Dublin in November 2010 to bring together representatives from UNCTAD, the five pilot port communities, the Irish Government, Dublin Port Company, the Port of Cork and Belfast Harbours Commissioners. The purpose of the meeting was to assess and analyse the results of the pilot project. The 29 high-level representatives who attended the meeting confirmed their commitment to the Programme's continuation. Moreover, the Port of Cork and Belfast Harbour Commissioners decided to join Dublin Port Company as port partners of the

Programme and provide support and expertise. Irish Aid reaffirmed its interest to financially support the Programme. The second cycle began in June 2011.

The port communities that were active members for the second cycle of the English-speaking network were:

- Ghana – Ghana Ports and Harbours Authority, Atlantic Port Services, Unicontrol Commodity Limited, SDV Ghana, Ghana Shippers Authority, Antrak Ghana, Golden Gate Services, Supermaritime, Regional Maritime University, Gemini Maritime Services Limited and Macro Group;
- Indonesia – PT. Pelabuhan Indonesia I (Medan), PT. Pelabuhan Indonesia II (Jakarta), PT. Pelabuhan Indonesia III (Surabaya), PT. Pelabuhan Indonesia IV (Makassar) and Multi Terminal Indonesia;
- Maldives – Maldives Ports Limited;
- Namibia – Namibia Ports Authority, Spanam Shipping Services C.C. and Subsidiary Co., Ocean Liner Services, Costal Imports and Exports, Trade Ocean Shipping, and the Namibian Navy (Ministry of Defence);
- United Republic of Tanzania – Tanzania Ports Authority and Tanzania International Container Terminal Services.

B. CORE FEATURES OF THE PORT TRAINING PROGRAMME

The Port Training Programme targets port managers and the main features of the programme are the following:

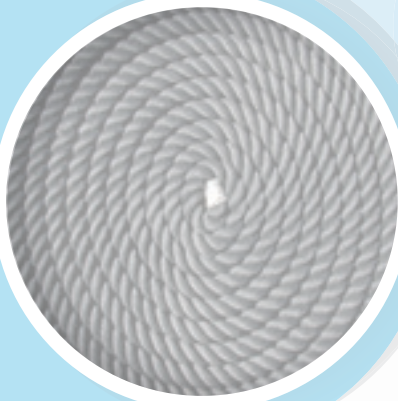
- Worldwide network-based structure;
- Public-private partnership model;
- Sustainable training and capacity-building programme;
- Human resources empowerment tool for talent management;
- Powerful scheme to induce value added solutions in port communities;
- Robust methodology for knowledge sharing and ICT advancement;
- High-end course on modern port management.

The modern port management course, one of the core features of the programme, consists of 240 hours,

divided into eight modules that cover all aspects of managing a modern port. The course is delivered over a two-year period. Participants must successfully complete the eight modules and draft and defend a final dissertation in order to obtain the UNCTAD Certificate in Modern Port Management. The course content is adapted to local contexts.

After successfully completing the course, participants must draft and present a final dissertation (approximately 30 pages), which they must defend in front of a panel of port experts. The final dissertation requires that each participant identify a concrete challenge within his or her respective port, carry out an in-depth analysis and propose concrete management solutions.

CHAPTER 2:
**PORT
MANAGEMENT
CASE STUDIES**



The purpose of the dissertation is for the participants to put into practice the knowledge gained from the modern port management course. The Port Training Programme is, above all, a professional training programme. It is designed by professionals in the port industry, for professionals in the port industry. The goal is not just for the participants to learn new ideas and concepts, but to contribute to improving operations in their ports by applying what they have learned.

The dissertation should be analytical and practical, which means the research should be immediately applicable to port operations. Therefore, participants are directed towards a research topic that addresses a specific problem faced by their respective ports. This guidance is provided by the participant's mentor – a senior manager in the port. Having the participants consult with senior managers ensures that the research and findings will be of high interest to top management. This increases the likelihood that aspects of the dissertation will be implemented or integrated into management strategies. The Programme has also found that bringing senior and middle managers together is essential for creating

a culture within the port that fosters the transfer of knowledge.

The participants must defend the results of their dissertations before a panel of port professionals and experts: senior managers from the local port community, senior managers from other port communities that are members of the Programme, senior managers from the Programme's port partners and representatives of UNCTAD. Each panel is composed of three members, including the participant's mentor. The panels evaluate the dissertations based on the following criteria:

- Clearness of the explanation of the problem and issues at hand;
- Pertinence of the research conducted;
- Quality of the analysis and ability to reflect on the practical implications of the suggestions made;
- Quality and feasibility of the conclusions proposed;
- Professional aspect of the work accomplished: The work must not simply consist of observations of what is going on; it must be useful to the company and help it to progress.

A. GHANA



Participants and jury members at the closing ceremony in Takoradi, Ghana, April 2013.

In Ghana, 29 participants from Ghana Ports and Harbours Authority, Atlantic Port Services, Unicontrol Commodity Limited, SDV Ghana, Ghana Shippers Authority, Antrak Ghana, Golden Gate Services, Supermaritime, Regional Maritime University, Gemini Maritime Services Limited and Macro Group were enrolled in cycle II of the programme. Eighteen participants successfully defended their dissertations and received UNCTAD's Modern Port Management Certificate (one participant from the previous cycle also successfully defended his dissertation).

Eleven participants chose topics focused on improving the efficiency of port and terminal operations. The factors studied included the performance of private stevedoring companies, and equipment maintenance schemes. Five participants chose topics that addressed the issues of environmental impact and security. Four participants focused on challenges arising from the development of oil facilities and the impact of oil trade on existing traffic in the Port of Takoradi. Three participants selected topics related to serving land locked countries. The other participants

looked at issues related to information communication technology, safety, and handling and storage systems.

Following the presentation and defence of each dissertation, the jury panels deemed the following dissertations to have achieved the highest results. The basis of assessment is a combination of the relevance of the topic, the quality of the research, the accuracy of the analysis and the pertinence and feasibility of the recommendations.

1. An Investigation into the Factors Militating against the Growth of Transit Trade through the Ports of Ghana: A Case Study of Takoradi Port, by Peter Amoo-Bediako.
2. An Evaluation of Equipment-holding Capacity of Private Stevedores in the Port of Tema and its Effects on Cargo Handling Performance, by William Norman.
3. Examination of the Role of Ports in the Oil and Gas Industry: A Case Study of Takoradi Port, by Kenneth Kwame Aidoo.

A summary of each of the selected dissertations follows.

1. An investigation into the factors militating against the growth of transit trade through the ports of Ghana: A case study of Takoradi Port

Mr. Peter Amoo-Bediako, Senior Marketing and Public Affairs Officer, Ghana Ports and Harbours Authority. Mr. Amoo-Bediako works in Takoradi Port.¹



Mr. Amoo-Bediako receiving his award during the closing ceremony from Mr. Richard A. Y. Anamoo, Director General of Ghana Ports and Harbours Authority.

Introduction

In 2000, the management of Ghana Ports and Harbours Authority, in their pursuit to diversify the commodity portfolio of cargo handled through the ports of Ghana, increase traffic and revenue embarked on an aggressive marketing campaign in the landlocked countries (LLCs) of Burkina Faso, Niger and Mali. This initiative culminated in the signing of a memorandum of understanding (MOU) between the Government of Ghana and the Governments of the three LLCs. In addition, many agencies in Ghana also made efforts at collaborating with their counterparts in the landlocked countries.

In 2002, the Porto of Takoradi recorded 18,912 tons. By 2006 this figure had reached 256,094 tons. However, since 2007 the port has registered a sharp decline in the volume of transit trade to LLCs. In 2011, transit traffic to LLCs was only 31,883 tons.

The dissertation sought to identify key factors that have contributed to this decline and to identify opportunities, such as the emerging mining business, that Ghana

Ports and Harbours Authority (GPHA) could harness to better service the economies of LLCs.

Analysis

Between 2006 and 2007, transit trade decreased from 256,094 tons to 75,599 tons. Research showed that this was mainly due to the withdrawal of support by one transit client. When surveyed this client cited the following issues:

- The port outsourced the management of the port warehouses with the outsourcer paying a 25 per cent royalty on revenue to the port. This led to increased charges for port users with no recourse to port management;
- The transit customer requested a dedicated lease agreement for a dedicated transit shed, which apparently was not possible because of a government policy.

In 2008, transit trade increased to 209,890 tons but then fell to 14,485 tons in 2009 and dropped to a 10-year low of 1,158 tons in 2010. The following table on page 9 shows transit traffic for the Port of Takoradi between 2002 and 2012.

The decline in transit trade volume has been attributed to the fact that Ghana reduced to 51 tons the gross cargo weight (GCW) limit on cargo that is carried on vehicles for transit through the country. Previously, GCW was 75 to 85 tons. The author found that this reduction in GCW added considerably to transport costs and, as a result, diverted transit traffic from Ghana.

The author also identified the issue of issuance and acceptance of fumigation certificates from exporting countries. The Ghana Ministry of Food and Agriculture insists on the local issuance of phytosanitary certificates to cover all plant material regardless of overseas certification. There is an associated cost in this regard and it results in delays for vessels, which in turn makes the port less competitive. Interestingly, the same procedure does not apply in Tema port, where the same department of State does not have a similar interpretation of the certification requirements.

The author conducted structured surveys and interviews to gather information and better understand the position of important stakeholders in the logistics chain of transit trade, including the Ghana Haulage and Truck Drivers Association, the Ghana Shippers Authority, the Burkina Faso Shippers Council, the Burkina Faso Transport Association,

¹ Mr. Amoo-Bediako's mentor was Mr. Paul Asare Ansah, Marketing and Public Affairs Manager, Ghana Ports and Harbours Authority, Tema Port.

Transit traffic for the Port of Takoradi (2002–2012)											
YEAR	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Niger	4512	29886	96893	120655	88260	37573	90305			27463	2
Burkina Faso	4769	29023	34494	44772	51902	7901	8490	1135	991	3600	5442
Mali	9631	97222	30467	69969	33935	5654	501			0	161
Benin		501			23000					0	
Côte d'Ivoire		500	7004			13	27		143	811	223
Nigeria					18				20		
Togo			400		1		5010		4	9	104
Others				11428	58978	24458	105557	13350			26
Total	18912	157132	169258	246824	256094	75599	209890	14485	1158	31883	5958

Source: Mr. Amoo-Bediako's final dissertation.

freight forwarders, shipping lines, the Safe Bond Company, the Niger Chamber of Commerce, GPHA's own marketing and stevedoring departments and the GPHA representative in Burkina Faso.

In relation to the decline in transit trade through the port, respondents agreed that two important factors had been the implementation of axle load regulations and the insistence by the Ghana Ministry of Food and Agriculture that phytosanitary certificates be issued locally. They also identified the following factors:

- The bureaucracy of the customs clearance system that can take days to complete;
- The rent-free period at the port in comparison with the rent-free period at competing ports;
- The high number of unauthorized police check points for transit vehicles (up to 31);
- The unauthorized detention of vehicles in transit and the extortion of money from drivers;
- The lack of covered storage at the port (90 per cent of transit traffic is bagged cargo);
- Inefficient cargo handling services;
- The port agreement with Safe Bond Company Limited (SCL) and arrangements with the oil companies;
- The annual incremental increase in port charges.

Conclusion

The study revealed a number of factors that have contributed to the decline in transit trade through GPHA ports. Two important factors are the enforcement in

Ghana of maximum gross vehicle weight legislation (a similar legislation is not enforced in competing ports that also serve as access corridors to neighbouring LLCs) and the requirement to issue phytosanitary certificates locally. Another factor has been the reduction in available storage capacity at the port. Up to 80 per cent of available transit shed storage has been awarded to the oil exploration business and this has had a major impact on the space available for transit traffic. The fourth factor concerns inefficiencies in the State agencies responsible for clearing the goods transiting through the port. These inefficiencies lead to delays that add to the overall cost of doing business in the port.

Based on the factors identified by the study, the author proposed recommendations to reverse the decline in transit trade and, more important, to position GPHA to take advantage of business development opportunities that currently exist. These recommendations include:

- Reviewing with the Ministry the axle load policy and its general implementation/enforcement;
- Reviewing the SCL contract to determine if the allocation of resources is appropriate;
- Improving the handling equipment provided by private stevedoring companies;
- Reviewing with the Ministry of Agriculture the need to issue phytosanitary certificates locally;
- Reviewing the GDLC monopoly on the supply of dock labour for ship working;
- Reviewing the annual automatic incremental increase in port charges to reflect the economic reality;
- Setting up a port representative in each of the LLCs to promote the port.

2. An evaluation of equipment-holding capacity of private stevedores in the Port of Tema and its effects on cargo-handling performance

Mr. Eben William Norman, Assistant Stevedore Officer, Golden Gate Services. Mr. Norman works in Tema Port.²



Mr. Norman receiving his award during the closing ceremony from Mr. Gerard Deegan, representing the Port of Cork.

Introduction

The modern port is no longer a single entity but a component of the overall supply chain, and its operations have implications for all those associated with the transport of cargo and the movement of goods. Thus, port operations are now an integral part of supply chain management. Cargo handling, storage and associated services are now the criteria by which ports are assessed and classified in terms of customer service.

Cargo handling is the most expensive element of the total cost of transiting goods through a port – 30 per cent for petroleum products, 40 per cent for bulk, 40–50 per cent for containers and 60–70 per cent for general cargo. The objective for all commercial ports must therefore be to ensure that the cost of transiting goods through the port is as low as possible.

Until 1970, Ghana Ports and Harbours Authority (GPHA) performed all the cargo handling in the ports of Ghana. Subsequently, the World Bank encouraged the Government of Ghana to privatize part of the stevedoring activities. The objective was to increase competition and improve efficiency. Currently, 10 licensed stevedores operate in competition with

GPHA's stevedoring section. The quota system allots 7.5 per cent of cargo handling to each stevedoring company, thus private stevedores now carry out 75 per cent of the stevedoring in the ports. GPHA handles the remaining 25 per cent.

The last two decades have seen a prolific increase in the range and capabilities of mechanical handling equipment. If cargo has to be handled efficiently, critical factors such as the proper allocation, deployment and operation of the equipment available must be taken into account. To comply with the terms of the stevedoring licence, the private companies are required to acquire a minimum stock of cargo-handling equipment and to maintain such equipment as to ensure 80–90 per cent availability.

This study examined the cargo handling equipment of private stevedores operating in Tema Port and compared what they have available with the requirements specified in their licence agreements in an attempt to understand how equipment availability is affecting their performance, and thus the efficiency of handling cargo at Tema Port.

Analysis

The author obtained reliable data from the corporate planning department, which monitors the equipment holdings of private stevedores and carries out inspections on the equipment. Data were also collected through questionnaires that were sent to all 10 stevedores, 8 of which completed and returned the forms. The two companies that did not respond said that the information was commercially sensitive and classified.

Through the data collected, the author was able to determine that only 176 of the 370 pieces of the equipment required under the licence terms were in stock. In particular, 18 of the required 30 reach stackers were in stock, 31 of the required 50 terminal tractors were in stock, 25 of the required 100 semi-trailers were in stock and 2 of the required 40 forklift extension pieces were in stock. Seven heavy-duty forklift trucks were presented, all of which were out of service or in poor condition. The seven units presented accounted for the stock of four stevedores; the remaining six stevedores had no such equipment.

More importantly, of the 176 pieces that were in stock, only 82 met the required standard. Thus only 82 of the 370 pieces required under licence were available for operation.

An objective view of these facts must conclude that the private stevedoring companies have not supplied equipment as required under the terms of their licence.

² Mr. Norman's mentor was Mr. Samuel Ntow-Kummi, Corporate Planning Manager, Ghana Ports and Harbours Authority, Port of Tema.

In the attempt to understand why, the author conducted interviews with operation heads and those responsible for equipment procurement and hire, availability and maintenance. Of the eight respondent stevedores, four cited access to capital for equipment as a major problem. They suggested GPHA should guarantee the loans necessary to purchase the required equipment. Moreover, the consensus was that the one-year licence currently offered by GPHA was too short for lending agencies to fund the purchase of expensive equipment. In their view, a five-year licence would be a reasonable time frame to make repayments.

Interviews with the operations managers of the five main shipping agencies in the port allowed the author to understand their perspective. According to the agencies, the deployments of private stevedores and equipment were deemed to be up to date in the handling of break-bulk and general cargo. Container handling ship-to-shore was generally acceptable, but the service failed when it came to the provision of tractors and trailers to move the units to the stacking area. In the case of Ro-Ro operations, the ship agent said that only five of the 10 private stevedores were acceptable. They made this decision on the basis of equipment and delays caused to their vessels.

The author carried out 15 four-hour sessions, personally observing private stevedores. During his observations, the author noted the following:

- 60 per cent of equipment required for general cargo operations was deployed. This was inadequate;
- The method of berth allocation for vessels meant the quayside trucks had to travel two kilometres from ship side to store. This means that, without additional vehicle allocation, the ship operation was doing four cycles for every shore side cycle completed;
- A container vessel working two cranes should have two reach stackers ship side and two reach stackers in the stacking area; however, in almost all cases only one reach stacker was in the storage area and it was moving between 20 foot and 40 foot stacks.;
- Inevitable breakdowns occurred, but it took maintenance staff 30 minutes to respond, another 30 minutes to go for equipment and/or parts, 30 minutes to come back, and 30 minutes to complete the necessary repair. This amounted to a total of two hours' delay.

More importantly, the stores are not accessible during night operations, which means that in some instances cranes and other equipment are shut down until morning;

- Heavy forklift trucks were not evident in any operation. The stevedores felt the mid-range was sufficient and the reach stackers could be deployed for heavy lifts. In the author's opinion, this is inappropriate use of equipment and slows productivity;
- Observations showed that in over 60 per cent of operations the same machine operators were deployed over the entire working of the ship in port. This caused fatigue, and productivity diminished as time went on.

To assess the performance of the private stevedores, the author gained access to 40 timesheets over a period of three months, from which he extracted the following details:

- Ro-Ro operations: 91 per cent productivity with 6 per cent equipment delays;
- Dry bulk operations: 90 per cent productivity with 10 per cent equipment delays;
- Break bulk operations: 75 per cent productivity with 9 per cent equipment delays;
- Container operations: 66 per cent productivity with 25 per cent equipment delays.

Conclusion

The study and observations indicated that the investment in equipment by private stevedores is inadequate, as the equipment available does not conform to the requirements of the licence. According to the findings, the private stevedores are working with 50–65 per cent of the required equipment, in comparison with the 80–90 per cent requirement of the licence agreement.

This has a negative impact on their performance and thus on the cargo handling services provided at the Port of Takoradi. The 25 per cent delay in working container vessels was due to limited equipment availability and equipment failure in the course of operations.

In general, the private stevedore companies' opinion is that the capital investment required to purchase the necessary equipment is too high, and access to capital is a major problem. They suggested GPHA should guarantee the loans necessary to purchase the required equipment.

The stevedores also cited the one-year licence as a major factor preventing them from being able to secure the funds necessary to invest in expensive equipment.

Based on the findings, the author proposed the following recommendations:

- GPHA should consider replacing the one-year licence agreement with a five-year licence to allow private stevedores to obtain the necessary funding to meet the equipment provisions of the licence;
- GPHA should carry out regular inspections of the availability of equipment to ensure the private stevedores have the quantity and range of handling equipment as set out in the licence agreement;
- GPHA should consider allotting agents for the manufacturers of handling equipment space and workshops within the port area to improve the availability of genuine spare parts and to assist in the maintenance of equipment;
- GPHA should examine the establishment of their own equipment pool that would be available for hire by private stevedores, or the possibility of establishing a plant pool by a consortium of GPHA and the private stevedores with autonomous management, in order to provide equipment for hire and augment the availability of equipment.

3. Examination of the role of ports in the oil and gas industry: A case study of Takoradi Port

Mr. Kenneth Kwame Aidoo, Credit Controller, Ghana Ports and Harbours Authority. Mr. Kwame works at Takoradi Port³

Introduction

The Port of Takoradi handles about 70 per cent of national exports and 18 per cent of national imports. Included in the import figure are chemicals for the oil and mining industries. Some of the land within the port area is leased to private oil and gas companies to facilitate their operations. A berth is dedicated to an oil company to avoid any delays to the turnaround time of their vessels in the port. Moreover, the port serves as a transit point for most of the equipment needed

³ Mr. Aidoo's mentor was Mr. Martison Ankobiah, Fishing Harbour Manager and Port Safety Security Manager, Ghana Ports and Harbours Authority.



Mr. Kwame Aidoo receiving his award during the closing ceremony from Captain James Owusu-Koranteng, Director of Takoradi Port.

for production at the rigs, as well as warehousing for maintenance and storage landside.

However, the perception is that certain economic, environmental, political, social and technical factors are a hindrance to the port and are militating against the efforts being made by the port to meet the service delivery that is expected by the oil industry. This study was undertaken to establish what these gaps are, why they exist and what can be done to close the gap in the interest of the customers and the port.

Analysis

The research was carried out with oil company staff, taking into account their experience in the business before arriving in Ghana. This would serve as a yardstick for their expectations and would allow establishing gaps in service and delivery.

The research within the port company was carried out across a range of departments: security, operations, logistics, estate management, environmental management, finance, marketing, marine, fire and safety. All of the survey's carried out within GPHA were by way of personal interviews.

The challenges that were highlighted as a result of the survey showed a wide variety of issues that reflected poorly on the overall service. Among others, they included:

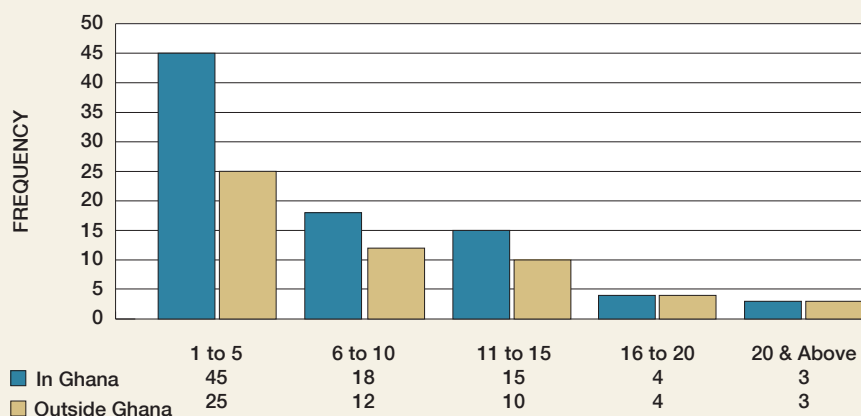
- Delays in the annual renewal of security passes;
- Inaccurate information on the expected arrival time of supply vessels;
- Non-availability or late arrival of mooring men for berthing and or departure;

Rank of the survey population



Source: Mr. Kwame Aidoo's final dissertation.

Years of experience of the survey population in the oil and gas industry



Source: Mr. Kwame Aidoo's final dissertation.

- Delays that resulted from the necessity to verify the accuracy of port accounts presented for payment;
- Low availability on demand of fresh water to supply vessels;
- The water barge has now been out of service for more than one year;
- Non-availability of suitable mobile harbour cranes and maffi trailers;
- The time delay between worker changeovers at the end and beginning of shifts;
- Dust arising from some bulk cargo operations completely stops the working of supply vessels;
- Delays caused by the direct discharge from LPG tankers to LPG road tankers;
- Poor state of internal port roads;
- Enforcement of speed limits within the port area;
- Lack of provision of good lighting for night-time working at the port;
- General poor environment due to lack of refuse bins throughout the port;
- Insufficient car parking facilities at the port;
- Lack of good electronic means of communication.

Conclusion

In assessing the issues raised in customer surveys, the author put the issues to the various internal departments and it appears there is good reason to accept the points raised by customers as valid. A critical assessment of this research has shown that Takoradi Port is perceived by the oil and gas customers as lagging behind in the provision of expected levels of service delivery.

Based on the findings of the study, the author proposed recommendations for improvement, which included:

- Education for all staff in relation to the cost impact of poor service provision;
- Training of dock workers to work more efficiently and with greater consideration for safety;
- The need for greater staff and dockers to understand that future continued employment depends on the quality of service provided;
- Consideration of outsourcing to private entities services that are provided to oil customers (this could be done as a pilot scheme);
- Relocation of mooring persons closer to port operations;
- Provision of public conveniences to improve the sanitary condition of certain port areas;
- Provision of electronic transfer of information and data to improve communications between port users;
- Establishment of a section within the port administration to deal with the oil and gas industry (staff the facility with suitably experienced and trained personnel).

B. INDONESIA



Participants and jury members at the closing ceremony, Bogor, Indonesia, March 2013.

In Indonesia, 21 participants from Pelindo I (Medan), Pelindo II (Jakarta), Pelindo III (Surabaya), Pelindo IV (Makassar), and Multi Terminal Indonesia were enrolled in cycle II of the Programme. Thirteen participants successfully defended their dissertations and received the UNCTAD Modern Port Management Certificate (two participants from the previous cycle also successfully defended their dissertations and earned the certificate).

Eleven participants chose topics that related to traffic growth and assessed opportunities for improving productivity, increasing capacity and introducing new operating systems. Three participants selected topics related to human resources management, including staff education and motivation, and the practice of outsourcing. The opportunity to create hub ports in Indonesia was the focus of two participants. Other topics chosen by participants focused on ITC and customer satisfaction, logistics services, managerial roles, navigation safety and insurance.

Following the presentation and defence of each dissertation, the jury panels deemed the following dissertations to have achieved the highest results. The basis of assessment is a combination of the relevance of the topic, quality of research, accuracy of analysis and pertinence and feasibility of the recommendations.

1. Port Marketing: How Customer Relationship Management Can Improve a Port's End-to-End Marketing Activities, by Banu Astrini;
2. Analysis of the Optimization and Expansion for Pontianak Port to Handle the Expected Increase of Container Traffic, by Harry Nugraha Haedi;
3. Outsourcing Practice at Indonesia Port Corporation II: Problems and Solutions from a Human Resources Perspective, by Chiefy Adi Kusmargono.

A summary of each dissertation follows.

1. Port marketing: How customer relationship management can improve a port's end-to-end marketing activities



Ms. Astrini receiving her award during the closing ceremony from Mr. Mark Assaf, Chief of UNCTAD's Human Resources Development Section/TrainForTrade.

Ms. Banu Astrini, Assistant Senior Customer Manager, Pelindo II⁴

Introduction

Indonesia is an archipelago of 17,508 islands, 6,000 of which are inhabited by 240 million people. There are 1,887 ports in Indonesia.

The operation and management of all the commercial ports is the responsibility of PT Pelabuhan Indonesia I, II, III and IV. The Ministry of Transport or local government operate the country's non-commercial ports. Special terminals and dedicated terminals are generally owned and operated by cargo owners. Port development, investment and operation can be the responsibility of State-owned enterprises or private operators.

PT Pelabuhan Indonesia II is the largest of the four State-owned port companies and manages a total of 10 ports and associated facilities, including Port Tanjung Priok, the busiest container handling port in Indonesia. Its market is all of Indonesia and Asia. The company's total assets are \$1 billion and the total profit for 2011 was \$156 million. Key customer segments are shipping lines and cargo owners; however, stevedoring companies are the biggest customer at

⁴ Ms. Astrini's mentor was Mr. Kiki M. Hikmat, General Manager Port of Pangkalbala.

a corporate level. Each port the company manages increasingly faces many forms of competition – intra-port and inter-port, local, national and international.

The results of customer satisfaction surveys from 2009–2012 indicated that customers were “fairly satisfied” across all port services. While this result could be viewed in a positive light, the author thought it was interesting to note that customer satisfaction, according to the surveys, had improved much during the period. Interestingly, the surveys also revealed that responsiveness constituted the largest gap between customer expectations and service provided.

In 2010, a corporate restructuring programme commenced. This included a plan to improve customer service and key account management. To date, however, the port has not carried out comprehensive segmentation based on commercially refined categories such as customer lifetime value or regency, frequency, monetary. Business development activities stem from external proposals rather than from planned prospecting. The port appears to cater to all customers equally, regardless of volume or revenue contribution. The absence of a one-stop-shop procedure means that customer transactions vary from one port branch to another.

This study aimed to identify the ways in which Customer Relationship Management (CRM) could empower members of the company to improve the end-to-end marketing of the company's marketing activities, thanks to account mapping, customer profiling and customer need profiling. This would allow the company to get better value from the leads and customers it already has.

Analysis

The author conducted extensive research in relation to the subject of CRM. From her literature review, she retained the following important information: a 5 per cent improvement in customer retention can increase profitability by margins in the range of 25–100 per cent; the cost to attract a new customer was estimated at five times the cost of retaining an existing one; and in many companies no more than 20 per cent of customers contribute 80 per cent or more of the profit.

In order to better understand customer transactions, the author carried out an analysis of the available internal historical data on customers. The majority of customers are long-established clients; there are few new major customers and there is little variation from year to year.

Following the customer data analysis, the author carried out a customer survey, for which there were 60 respondents: 10 shipping lines, 10 logistic service providers and 40 cargo owners. The respondents constituted a good sample population, considering the company has between 100 to 200 major customers.

Data were processed to establish customers' criteria for selecting a port and for switching ports. Additionally, the author carried out in-depth interviews with customers and documented information on customer complaints, irregularities in customer and port services, and media coverage.

An analysis of the data collected from the surveys showed that, in terms of revenue, the top five customers accounted for 83 per cent. These were terminal services (37 per cent), vessel services (15 per cent), cargo services (13 per cent), business partnerships (9 per cent) and container terminal services (9 per cent).

Analysis of customer data showed that the port had close to 5,000 active customers, but that 23 clients contributed 50 per cent of the revenue. Moreover, the analysis showed that the top 100 customers accounted for 80 per cent of the revenue.

Of the top 100 accounts, 52 are shipping lines or shipping agents; notwithstanding, stevedoring companies dominate the top 10, 20, 30 and 40 accounts. These figures highlight the stevedoring companies' stronghold in intermediary and subcontractor roles. The figures show that, as the cargo owners are not the biggest accounts, the port company deals with the end customer through intermediaries. This may prevent the port company from effectively presenting and promoting its services to the ultimate end user – the cargo owner.

The survey results also highlighted a low level of customer loyalty. With regard to choosing a port, customers said they were attracted by new technology and new operating systems. They also pointed out that the switching costs are relatively low. This is a real threat.

In the context of port selection, the survey revealed that freight forwarders were more concerned with cost and price and cargo owners were attracted to value-added services and location. The challenge for the port is to effectively market to the end user – the cargo owner – its location and the value added services it offers.

The in-depth interviews with the customers revealed a number of major issues that the cargo owners would like the port to improve, including:

- Responsiveness and efficiency;
- The need for a more customer oriented culture in the organization;
- A speedy dispute resolution procedure;
- A clear single point of contact;
- The need for facilities and services provided by other high performance terminals;
- Value for money in the case of container tariffs and quay rent due to port congestion;
- High tariff charges can be accepted but only when accompanied by high productivity;
- The reduction of documentation formalities for transporters;
- Concentrate on basic services – “need-to-have” before “nice-to-have”.

Conclusion

Based on the research conducted, the author concluded that ports should focus on customers. They should know who their best customers are and what these customers want, and should know how to deliver services in a way that develops customer loyalty and leads to business retention. Customer satisfaction and customer loyalty lead to relationship marketing.

CRM is a strategy to capture, sustain and grow customer relationships by aligning an organization's people, processes and technology to better support customer needs for the long term. It is about driving bottom-line revenue through proactive management of the customer life cycle, and enabling the seamless integration of every area of the organization that affects the customer.

CRM can offer the following benefits: reduced costs, increased revenue, market intelligence, service developments, financial and forecasting accuracy, and customer loyalty. The concept of CRM can also be developed as a management information system or, ultimately, as an enterprise resource management process that facilitates information sharing on a company-wide basis.

According to the author, ports need to identify the services most sought after by existing and potential shipowners and cargo owners. The ports need to implement the means necessary to provide these

services and promote them to encourage and optimize use. The port should implement a CRM system to improve marketing activities and empower the organization's entire staff to deliver services that meet the customer's needs and expectations. This would include:

- Providing the framework for better internal company-wide coordination and information sharing;
- Creating a platform that enables effective customer interface and ensures the customer experience is consistent across the entire organization;
- Setting up a data base that contains the necessary information to identify key clients and carrying out a value based segmentation of customers (loyalty and lock-in potential).

2. Analysis of the optimization and expansion for Pontianak Port to handle the expected increase in container traffic

Mr. Harry Nugraha Haedi, Port Facility Security and OSH Assistant Senior Manager, Pelindo II⁵

Introduction

The container terminal port in West Kalimantan is currently the only facility for a population of five million people. The terminal throughput grew by 15 per cent between 2010 and 2011. The port's economic growth is important for the province, but it is important that the container terminal at Pontianak Port be prepared to handle the expected growth in order to avoid problems of traffic congestion, which could have a negative impact – environmental, social and even economic – on the community.

It may be possible for the port to reduce congestion in the future by optimizing current operations and capacity, by moving some functions to a new port at the same site or at a different site.

The author thus set out to measure the current port capacity and determine if it is sufficient to handle the expected growth in container traffic. The author also aimed to identify cost-effective actions the port could take to mitigate future problems that may arise as traffic continues to increase.

⁵ Mr. Haedi's mentor was Mr. Hadi Syafitri, Assistant Senior Manager of Facility Development and Environmental Management, Pelindo II.



Mr. Haedi receiving his award during the closing ceremony from Mr. Mark Assaf, Chief of UNCTAD's Human Resources Development Section/TrainForTrade.

Analysis

Data collection was carried out in two phases. The first phase consisted of on-site observations, examining areas such as layout, pilotage procedures, ship operations, quay transfer operations, yard operations, freight station operations and gate receipt and delivery procedures. The second phase involved the survey of the various government and institutional groups that control the service capabilities of the port.

The author assessed the handling capacity and area needed for existing and future requirements. Using the standard formula to assess annual capability, the study found the capacity of Pontianak Port to be 131,455 TEU.

The formula is $C = (L \cdot H \cdot W \cdot K) / (D \cdot F)$

- C is the annual capability (TEU/year);
- L is the number of ground slots in TEU;
- H is the mean stacking height;
- W is the number of working slots in TEU;
- K is the number of working days;
- D is the mean container dwell time;
- F is the peaking factor.

When this figure is compared with the volume of container traffic reached in 2011 (172,892 TEU) it can be determined that the current volume already exceeds the capacity of the terminal. Yet, using a standard industry formula to calculate the area required, the author was able to determine that the

current area available should be sufficient for up to 260,000 TEU. This means that, until this volume is reached, the port should be able to find solutions to increase terminal capacity without having to invest heavily in infrastructure, equipment, or technology. The study thus turned its focus on identifying measures that, without intensive capital investments, could improve the capacity of the port: optimizing current working practices, berth throughput, crane performance, the emptying and filling of containers, workload distribution and land use.

In examining the issue of ship turnaround time, it is important to take into account the working and non-working time and to examine the underlying issues that are affecting each area. The records for 2011 show that there were 433 ships (172,892 TEU) worked. Each ship was worked for an average of 72 hours, but the effective time was only 43 hours (60 per cent). The berth throughput is 586 TEU per m². If the effective work time were 72 hours, instead of 43 hours, an additional 115,261 TEU could be worked. This would amount to a berth throughput of 911 (172,892 + 115,261/295). Thus there is the potential to increase berth throughput by 391 TEU per m² without investing money in new infrastructure or technology.

Loading and discharging containers is a labour-intensive operation. On a daily basis, close to 1,400 workers are deployed in this operation. The activity is carried out 24 hours per day, divided into three eight-hour shifts with a one-hour meal break per shift (thus the effective work time is seven hours per shift, or 21 hours per day). The author discovered, however, that in practice two hours per shift are ineffective due to late arrival and extended breaks. This amounts to as much as six hours lost per day, which adds up to 42 hours per week, or 168 hours per month. In the context of a ship turnaround time of two to three days, recuperating this lost time would add three to four additional ships per month, 36 to 48 ships per year. Thus, recovering the time that is lost in the form of extended breaks could allow the port to work another 18 to 24 ships per annum.

Examining the container crane performance, the figures recorded show a current performance of 16 cycles. The crane is currently fitted with a manual spreader, which is slow and thus reduces its capacity. In addition, the back-up support of the handling equipment is not optimal. The author determined that with better planning and a small capital investment, the crane's capacity could be increased by nine cycles.

The transshipping requirement of exports and imports is done inside and outside the terminal. Forty per cent of the volume of imports and exports is loaded outside, while 60 per cent is loaded inside, due to the warehousing in the vicinity of the port. This means that 60 per cent of transshipping is done in the terminal, which delays ship working.

The average dwell time on quay for each container is nine days. The yard capacity has been established at 4,802 TEU. When this is compared with an average daily stock of 4,263, it can be determined that the container yard is operating at 80 per cent capacity. The majority of the traffic exported and imported is brought to and taken from the port by small trucks. The capacity to process vehicles efficiently and quickly at the gate is thus important to ensure that yard capacity is being fully utilized. Currently, about 200 vehicles pass through the two container terminal gates daily (during the available 21 hours). This means that it takes over 12 minutes for each truck to pass through the gate (2 gates x 21 hours x 60 minutes/200 trucks), which the author deemed to be high. A survey revealed that this high average for the trucks to pass through one of the gates was mainly due to the fact that the outside warehouses are closed all night. If the port could come to an arrangement with these warehouses to stay open at night, more units could be delivered to and from the port.

Conclusion

The author determined that the container terminal's capacity is currently under-used and that there are numerous opportunities to optimize the capacity of the existing facilities before proceeding to the development of a new port, or investing heavily in capital-intensive infrastructure or equipment. According to the author, these possibilities should be explored because they could create big opportunities for a reasonably small investment. The author also proposed the following recommendations:

- The layout of the existing terminal operations should be reviewed with a view to maximize the land area available and the facilities to be accommodated. The handling and storage of empty containers needs to be examined;
- The inclusion of outside parties and regulatory authorities in the process of introducing options to accelerate the provision of key services within the overall service cycle should be considered;

- The introduction of a container terminal management system fit for purpose would improve operations, communication, planning, monitoring and the control of the port, with the added value of accounting and accurate statistical information for future investment decisions;
- The implementation of tight supervision of facilities and personnel to ensure services are provided as per agreements and contracts is recommended.

3. Outsourcing practice at Indonesia Port Corporation II: Problems and solutions from a human resources perspective

Mr. Chiefy Adi Kusmargono, Senior Manager of Human Resources Planning Organization Development and Remuneration, Pelindo II⁶

Introduction

Globalization has generated competition among business organizations. As organizations try to control overheads to a fixed cost, many turn to outsourcing to deliver savings.

The Government of Indonesia has supported the practice of outsourcing as a means of reducing unemployment (8.3 million Indonesians were unemployed in 2010). In 2010, the World Bank noted that in Indonesia

⁶ Mr. Kusmargono's mentor was Mr. Cipto Pramono, Human Capital and Corporate Affairs Director, Pelindo II.



Mr. Kusmargono receiving his award during the closing ceremony from Mr. John Moore of Dublin Port Company.

only 35 per cent of the population (33 million) were permanent workers. In contrast, when the World Bank reported in 2006, the percentage of permanent workers in Indonesia was 70 per cent. This national trend is reflected in employment patterns in IPC II – the largest of the IPC Corporations, with responsibility for port operations in 10 provinces and for 12 commercial ports.

Workers see the system as a cause of uncertain conditions and discrimination. The issue of equal pay for work of equal value is central to the debate revolving around the practice of outsourcing, as often an outsourced worker is paid less for doing the same job as a permanent worker.

Pelindo II's permanent and outsourced workers (2006–mid 2011)



Source: Mr. Kusmargono's final dissertation.

The workforce is now composed of 2,482 permanent workers (58 per cent) and 1,783 outsourced workers (42 per cent). Comparing these figures with those of 2006 showed an increase of 162 per cent in the number of outsourced workers employed by IPC II, and a decline of 7 per cent with regard to permanent workers employed in the organization.

The purpose of the study was to identify the problems of outsourcing as practiced at IPC II, focusing on how it affects the worker, employer and outsource provider. The author also set out to understand the possible impact this practice may be having with regards to two of the corporation's goals: to establish a cooperative and mutual sense of belonging among port communities and to create customer-service oriented, faithful, friendly, positive, qualified personnel taking pride in the company and its culture while providing welfare and job satisfaction to the employees.

Analysis

The research relied on primary data taken from interviews, focus group discussions, as well as secondary data. The focus group and literature review were supported by case studies, which allowed the author to gain an in-depth understanding of outsourcing practices abroad to compare these with the practices observed in IPC II.

In the early days of outsourcing, the emphasis was on outsourcing areas of the business that were highly unrelated to a firm's core business activities. Currently, the trend is towards simply outsourcing to reduce labour costs. The majority of outsourcing is now done to enable organizations to have the necessary flexibility to respond more quickly to changing market demand and deal with business uncertainty.

The first issue examined was that of remuneration, regarding this issue, the author found that outsourced workers at IPC II are paid 36 per cent less monthly than the lowest-grade permanent workers. Furthermore, outsourced workers receive 59 per cent less annual take-home pay than the lowest-grade permanent worker. In one particular case, a permanent worker lost his job because it was outsourced; however, he was eventually hired back for the same job, but as an outsourced worker. As a result, he now earned 35 per cent less to do the same job.

In the area of social welfare, outsourced workers are also given less than permanent workers. In some

cases, the providers of outsourced workers manage the social protection and security of the workers. This can result in the absence of insurance coverage for work accidents or health problems and death for outsourced workers.

Outsourced workers are rarely given the opportunity for training and development. With regard to career development, there is no difference between an outsourced worker with five years' experience and a worker with no experience, the outsourced worker will have the same wages until retirement or death.

There is also the issue of age and marital discrimination. Those who employ outsourced workers generally require that the operatives be unmarried and between the ages of 18 and 24. This appears to be for productivity reasons. The outcome of this is that, in some instances, older outsourced workers are let go for reasons that are difficult to verify. In fact, since there is no measurement of outsourced workers' performance, they can be fired without any redress.

Job security is also an issue, as outsourced workers generally have one-year contracts. And it is more costly for the employer to extend or renew the contract, rather than to hire a new worker once the one-year contract has come to an end. Outsourced workers are seldom given the opportunity to become permanent workers.

The industrial relationship between the outsourced worker and his or her employer is not conducive to a good working relationship. Outsourced workers are not part of any company pay bargaining, and should an outsourced worker join a union directly or indirectly their contract will be terminated by virtue of the terms of their contract.

Conclusion

At IPC II, permanent and outsourced workers are employed in the same areas with the same responsibilities, yet their pay is not equal. This was identified as the primary source of dissatisfaction and de-motivation among outsourced workers. The second factor relates to the restrictions placed on outsourced workers to be appointed as permanent workers. Another source of dissatisfaction is the lack of access of outsourced workers to training and development to improve their competencies, and the absence of a career development programme. Moreover, the absence

of a performance appraisal for outsourced workers causes tension when outsourced workers' contracts come up for renewal.

These factors have even caused stoppages and disruptions at the Jakarta International Container Terminal. In light of these findings, the author proposed recommendations, including the following:

- The outsourcing system should be a subdivision of the IPC II Human Resources Department, to support the process in the context of customer satisfaction, shareholder added value and community development;
- The modification of the job grade to bridge the gap in wages and reflect the concept of equal pay for work of equal value;
- Allow outsourced workers who have good competences and discipline to follow a process that would allow them to be recruited as permanent employees;
- The outsourced service provider should have a performance appraisal mechanism with direct input from IPC II, which would form the basis of contract and recruitment and selection for permanent positions;
- There should be ongoing review of the services provided through outsourcing, so as to ensure that they are fully compliant with the terms of the contract awarded;
- The core jobs in IPC II should be clearly identified and agreed, and there should be no outsourcing of positions in these categories.

C. MALDIVES



Successful participants and jury members at the closing ceremony, Malé, December 2012.

In Maldives, 20 participants from Maldives Ports Limited (MPL) were enrolled in cycle II of the Programme. Ten successfully defended their dissertations and received the UNCTAD Modern Port Management Certificate.

The different dissertation topics chosen by the participants are grouped below based on common issues and themes.

Eight participants chose topics that focused on the importance of the port as a national resource, future challenges including privatization and the contribution of staff and machinery to the efficiency and reliability of the service to customers. Likewise, eight participants looked at opportunities to enhance the port facilities and services – for example, by providing improved electronic communication systems and container repair services to existing customers and by developing or improving port infrastructure to attract new traffic.

Finally, four participants selected topics in the area of occupational health and safety.

Following the presentation and defence of each dissertation, the jury panels deemed the following dissertations to have achieved the highest results. The basis of assessment is a combination of the relevance of the topic, quality of research, accuracy of analysis and pertinence and feasibility of the recommendations.

1. Study of Equipment Usage and Maintenance in Maldives Ports Limited, by Surahabeel Waheed;
2. Correlation between Motivation and Worker Efficiency at Maldives Ports Limited, by Ibrahim Visam Rasheed;
3. Hosting an e-Service Model in Malé Commercial Harbour, by Llyas Mohamed.

A summary of each dissertation follows.

1. Study of equipment usage and maintenance in Maldives Ports Limited

Mr. Surahabeel Waheed, Technician, Maldives Ports Limited⁷

Introduction

A World Bank technical report stated that, on average, equipment maintenance costs range from 15–25 per cent of the total operating costs in a port. According to Maldives Ports Limited's (MPL) Annual Report for 2011, equipment maintenance costs accounted for 25.6 per cent of operating costs, putting it outside the upper range of the average calculated by the World Bank. Equipment maintenance costs are MPL's highest single expenditure. The author believed these expenses should be examined and addressed as a matter of urgency, particularly at a time when revenue is down 12 per cent from the high reached in 2009.

This dissertation was thus a study of the maintenance and usage of cranes, rubber tyre gantry cranes, tractor trailers, lift trucks and tug boats at MPL. The subject by implication also considered the issues of driver selection and training, driver reporting mechanisms, maintenance records, maintenance staff qualifications and training, as well as machinery replacement processes and purchasing policies.

The author frames the data analysis and outcome of the research against MPL's quality management mission statement of having "the right equipment in the right place at the right time and at the right cost".

Analysis

The primary data used for analysis in the dissertation was collected using a combination of interviews with relevant management and staff in the marine, mechanical and operations divisions. Financial and operational records of the three divisions were also gathered and analysed.

A significant issue that resulted from the examination of the information available was that official specific targets regarding equipment availability were not documented. A framework for planned maintenance, routine inspections and removal from service was not in place, nor was there a procedure to examine all



Mr. Waheed and his mentor, Ms. Aishath Shimla, after receiving their awards during the closing ceremony.

equipment of a particular make and model for faults common to that vehicle or machine type. The result was costly repairs and, according to the author, low morale and motivation among maintenance staff.

The decision process for equipment replacement is determined by the present cost of acquiring identical units at fixed intervals. The intended use or changes in the utilization of any particular piece of equipment did not appear to rank high in the procurement process; neither did any alteration to the cargo handling methods for particular goods. Consideration of these factors could and should be central to the procurement process; however, the information required to evaluate the equipment in this manner was not recorded.

The majority of vessels are handled at quayside berths, but vessels in excess of 15,000 DWT are handled at an anchorage, and the cargo or containers are taken ashore by barges. This combination of activities involves three divisions within the organization: cargo operations, marine engineering and mechanical engineering. Each division has its own demands, priorities and responsibilities; nevertheless, each is dependent on the others and effective cooperation is critical to the overall standard of service provided and to the financial and future profitability of the port, which is crucial for future development.

The availability of equipment for maintenance was recorded as a major issue. This is not uncommon in any port community. In this study, it appears that, in the case of MPL, the absence of an annual preventative maintenance schedule with proper costs

⁷ Mr. Waheed's mentor was Ms. Aishath Shimla, Head of Procurement Department, Maldives Ports Limited.

apportioned, discussed and agreed between the three divisions and finance for the year, contributed to the situation. The study highlighted the need for balance between the requirements of each division in order to allow proper maintenance to prolong the useful working life of machinery that in many cases has passed manufacturers expectations. According to the dissertation, the system of maintenance in place in MPL does not allow for the orderly or cost-effective procurement of spare parts. As a result, in 2011 spare parts accounted for 25 per cent of the port operating costs. Fuel, in contrast, only accounted for 17 per cent of the operating costs.

In one instance, a unit was out of operation for 16 months, from January 2011 to April 2012. The original cause was engine failure, but the delay was incurred while waiting for a spare part. Likewise, a barge handler was unavailable for seven months, from July 2012 to December 2012, due to engine failure. According to the engineering report, this occurred because of the lack of proper maintenance. In each case, the port was obliged to rent replacement equipment. As a result, there was the cost of hiring the replacement equipment in addition to the costs associated with the unavailability of the unit.

Employee qualifications and their ability to operate machinery appeared to be contributing to the breakdown of machinery. Ongoing training is a requirement in all business environments and should be part of human resources planning, as it can result in improved performance and efficiency. As an example, the author cites the case in which economic driving techniques taught on site resulted in a 20 per cent decrease in fuel consumption.

Statistical data is essential for good operations and maintenance planning, as it can provide the information necessary to determine the number and type of handling equipment required to carry out port services on any given day. Statistical data can also identify what units may need maintenance. Collecting reliable statistical data, however, requires a cross-departmental commitment to ensure that drivers' daily logs are properly completed and monitored for faults. More importantly, the drivers must be trained to highlight minor problems that could result in expensive breakages and or machine failures that could be avoided with maintenance. To this end, it is imperative to ensure that all metering and monitoring capabilities on the equipment are in good working order and accurately calibrated.

Conclusion

MPL's financial report for 2011 showed the cost of spare parts to be \$1.1 million. The financial report also indicated that maintenance represented 25.6 per cent of total port operating costs. Considering the findings of the study, the author believes it is possible to reduce maintenance to 15 per cent of total operating costs. According to him, the following are processes and procedures that could contribute to reaching the objective:

- The three divisions should agree on and adhere to a maintenance schedule;
- MPL should carry out an equipment risk analysis to identify crucial spare parts that should be kept in stock at all times;
- Procurement policy should give preference to standardized equipment types in order to facilitate and improve maintenance;
- Maintenance requirements and equipment available for maintenance should be updated daily and provided at least 24 hours in advance;
- Equipment rotation should be introduced to facilitate preventive maintenance and improve equipment working life;
- The maintenance expenditures for each piece of equipment should be recorded. These records of maintenance expenditures should distinguish the cost of spare parts and cost of labour;
- MPL should provide continuous on-site training for staff involved with driving and maintaining equipment.

2. Correlation between motivation and worker efficiency at Maldives Ports Limited



Mr. Rasheed with his mentor at the closing ceremony, Ms. Aishath Shimla.

Mr. Ibrahim Visam Rasheed, Assistant Tally Officer, Maldives Ports Limited.⁸

Introduction

This study looked at three main factors of motivation: economic, environmental, and psychological. The study focused on the topic of staff motivation; in particular, the author sought to understand how different factors motivate different employees, in the attempt to help improve their efficiency and performance.

According to the author, one must understand the character of the individuals and their work environment in order to understand what drives them. Motivation comes in many forms: financial rewards, bonuses, verbal praise and recognition. What is important is not the form of motivation used, but rather the results – it must lead to improved efficiency and better results.

This study sought to identify the key challenges to motivating staff in the Port of Malé, and to offer solutions and recommendations.

⁸ Mr. Rasheed's mentor was Ms. Aishath Shimla, Head of Procurement Department, Maldives Ports Limited.

In relation to the motivation of the labourers, the author posed the following questions: Are they treated fairly and are they recognized for their contribution to the customer service provided and to the efficiency of the port?

Analysis

Maldives Ports Limited (MPL) manual labourers work in difficult conditions: They work two eight-hour shifts per day, the daytime temperatures are often high, there is very little shade to shield them from the sun, and the nights are often cold and wet. Sometimes, the loading and unloading of vessels is performed off shore, which entails inevitable risk. MPL employs 700 staff, of which approximately 100 are labourers.

The author collected the primary data for this study through questionnaires. A total of 40 questionnaires were sent to labourers and managers of the cargo operations department. A total of 35 of these were answered and returned.

Secondary data were collected from reports and internet websites, UNCTAD publications and other academic reports.

The author reviewed literature on the theory of motivation in relation to the hierarchy of needs. The basic needs that all people aspire to are clothing, food and shelter. Once these needs have been met, the search then turns towards luxury goods, such as expensive clothes and computers. When these have been acquired, the need for self-respect and recognition comes to the fore.

The author used the survey responses to better understand the hierarchy of needs of labourers at the Port of Malé and which factors motivate them.

Salary and wages

As money is necessary for all humans to meet their needs in life, the labourers placed income high on their list of priorities. Of the 35 respondents, 30 stated that salary was the important motivator. However, three respondents answered that recognition was even more important.

Job security

All humans live in the hope that tomorrow will be better than today. If people feel that they can secure their future, they will feel motivated and increase their productivity. Of the 35 respondents, 29 indicated that job security (the guarantee of employment) was a

strong motivating factor. According to the author, MPL needs to address the issue of job security and reassure staff that increased efficiency will secure employment, as better productivity will retain customers and lead to more customers.

Relevance and job satisfaction

In the hierarchy of needs, people need to feel a sense of belonging and acceptance if they are to perform well. The questionnaire results indicated that labourers believe the work they perform is important and contributes to company results and customer satisfaction. Thirty-two of the 35 survey respondents indicated that this type of feedback was important and was a motivating factor for them to continue striving to improve port efficiency.

Remuneration

People work in order to earn money to fulfil their needs and aspirations. They welcome bonus payments based on company results. Retirement plans are part of an overall remuneration package. That a company looks after the welfare of their staff in retirement in relation to the number of years they have served the company is a definite motivating factor. In the survey responses, 28 of the 35 respondents agreed that the current retirement package being introduced guarantees future compensation. Interestingly, however, five workers suggested early retirement packages for older workers in order to replace them with younger workers and, by that means, maintain efficiency. Overall, the results indicated that the total remuneration package, including retirement, is definitely a motivating factor.

Facilitation

MPL is introducing new handling equipment and training employees to operate these properly and safely. The introduction of this equipment will help increase revenue. The staff responses were split on this question and would need more detailed examination. Of the 35 respondents, 14 agreed with the concept of introducing the equipment and 11 agreed the equipment was adequate for the work to be undertaken; however, 10 were of the opinion that the equipment lacked quality. This highlights an area where the company needs to demonstrate the long-term benefits of the equipment with regard to job security, as well as the associated benefits the equipment will bring, in order for it to motivate the staff accordingly.

Insurance

MPL provides all staff with medical and accident insurance coverage. Almost all respondents (34 of 35) supported this benefit and stated that it met their expectations. These results confirm that the motivating factor of safety and security is recognized and accepted in MPL.

Health and safety

Port areas are, by the nature of the business and the constant movement of heavy machinery, a potentially dangerous work area. For MPL staff there are the additional risks associated with working off-shore loading and discharging vessels. MPL is introducing "health, safety and welfare at work procedures" to reduce the possibility of accidents. In view of the present working arrangements, there will be a major education programme organized to convince workers that these procedures will enhance the company profile and, in turn, ensure its continued success and guarantee their future. Of the 35 respondents, 15 indicated they were well aware of the procedures, 15 indicated they had a satisfactory knowledge and 5 indicated a lack of knowledge of the subject.

Training

When asked if they had received training in relation to the work to be performed, 16 labourers indicated they were well-trained, but 19 indicated they had received no training at all. These survey results indicate that there is an issue independent of training as a motivating factor. Workers seemed to be demotivated by the fact that they were not selected for training; this led them to see themselves as less important than others for the operations of the port.

Recreation

MPL provides a staff club house and a gym and has a staff recreation department. A total of 21 respondents indicated that the facilities were inadequate. This could be attributed to the increasing staff numbers. Twelve workers stated that additional well-maintained and organized facilities would motivate them in their work.

Promotion

Promotion is a means by which individuals can measure the results of their work, and whether or not their efforts have been appreciated. Of the 35 respondents, indicated that promotion was based on

appraisal and performance, and nine suggested it was in recognition of their work.

Appreciation and recognition

Staff members like to feel that they are being monitored and rewarded for their work. If their work and efforts are valued they will know that the good work is rewarded and will be motivated to work even harder. Of the 35 respondents, 33 indicated that a little verbal indication of good work would be a motivating factor.

Recommendations

The respondents recommended that the work environment be improved so that it is more positive and friendly. Workers indicated that something as simple as being greeted with a smile, or small forms of recognition of their efforts, regardless of how menial the duties or tasks performed, could be strong motivating factors.

A programme to bring staff together in a social environment would assist in promoting workplace cooperation. Picnics or fishing trips during bank holidays, when all staff and workers could get together, would support staff bonding, improve working cooperation and motivate staff. This would be a benefit to the company.

Conclusion

In order to maintain efficiency within employees, it is vital to motivate. Motivation for MPL labourers could come in many forms and need not be limited to salary raises. Considering the findings of the study, the author proposed recommendations, including the following:

- Consideration should be given to the appointment of a worker director to the Board of MPL;
- Consideration should also be given to the development of a recruitment department within the human resources department, to help ensure that positions are filled based on merit, qualification and experience;
- The human resources department and human resources system should be perceived by workers as independent, reporting directly to the CEO. This would be a big motivating factor for most workers, as it would reflect honesty, openness, transparency and freedom from improper influence.

3. Hosting an e-service model in Malé Commercial Harbour

Mr. Llyas Mohamed, Database Engineer, Maldives Ports Limited⁹



Mr. Llyas Mohamed receiving his award from Mr. Abdul Matheen Ahmed, Chairman of MPL, during the closing ceremony.

Introduction

The role of ports in the overall transport process – moving goods from producers to consumers – has changed. Likewise, ports are now a major factor in the economic and social wellbeing of a country.

The Port of Malé handles 90 per cent of the cargo that enters the Maldives. It services the needs of the nation whose population is spread out over 200 islands. A total of 103,693 people live in Malé.

The main challenges for the Port of Malé are limited space and infrastructure. The quayside facilities are capable of handling a vessel with an LOA (length overall) not exceeding 150 metres; they can handle vessels with a draft of up to 9.5 metres. There are no quay cranes. Vessel loading and discharging is thus performed with the ship's gear. There is a shortage of container storage space.

In this context, the author suggested that the introduction of port e-services by Maldives Ports Limited (MPL) would help the port authority streamline their services, improve its performance and better serve the nation.

⁹ Mr. Mohamed's mentor was Ms. Aishath Neesha Khaleel, Human Resources Manager, Maldives ports Limited.

Analysis

The study examined existing e-services technologies and looked at what is available in foreign ports, as compared to the current situation in the Port of Malé. The author also reviewed literature on the usefulness of ICT and e-services and conducted a customer perspective analysis of available services.

Data were collected through interviews, surveys and reviews from different port areas. The face-to-face interviews with managers and supervisors made it easier for those involved to clarify their opinions on the subject. The secondary data were retrieved from company documents.

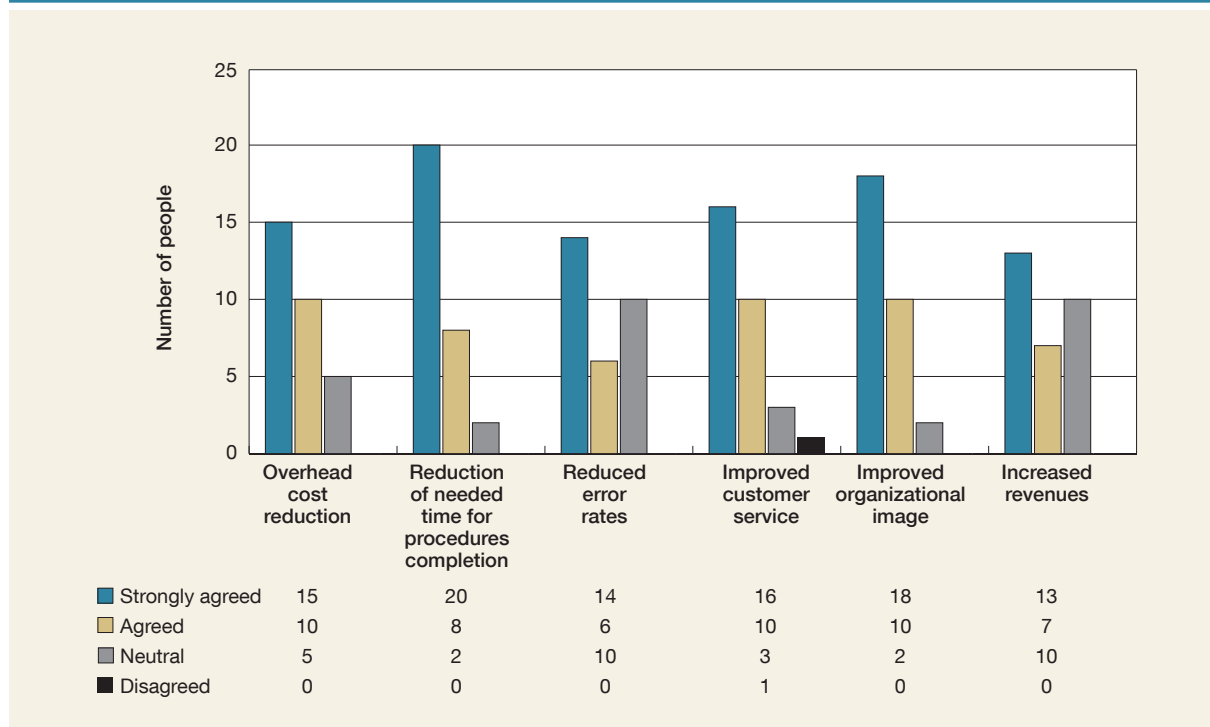
The principal use of ICT in ports is the terminal operating system (TOS). While emphasis has been placed on terminal management, it is now possible to share all the other information and documentation requirements of the business with the use of GPS, GSM, the Internet, Single Windows, wireless networks and electronic data interchange (EDI). The development of enterprise resource planning (ERP) has opened the opportunity for the single entry of data and information, which could then be made available to an entire organization and its external stakeholders.

The system allows for the transaction of services such as bookings and payments, and the sharing of information between the port authority and all other port services providers. Internal port services such as pilotage, navigation, vessel traffic management, security and the provision of ship services, such as crew changes and the supply of fresh water, can all be handled by the system. The availability of these facilities greatly enhances the services of a port and, in turn, its local, national and international reputation.

That most cargo is unloaded from containers at the port and delivered on smaller vehicles means the unloading and gate operations are critical functions at the port. In an effort to facilitate the clearance and transport of the goods, the containers are positioned overnight for next working day. This system, however, is unreliable and unproductive, as containers are often unloaded and the goods are often cleared in an untimely manner. According to the author there are many reasons for the delays; he cites the examples of documentation requirements, customs procedures and limited staff availability.

Automating the terminal operations would help develop an in-house solution for all areas of port operations, terminal management, yard planning, cargo handling,

Results of survey: Benefits of an e-service model



Source: Mr. Mohamed's final dissertation.

container tracking and integrated tallying. With regard to the availability within the port to deal with the necessary changes, the survey conducted by the author showed that the different departments within the port all already had Internet access and already used the Internet, thus the cost of participating in the scheme would be low.

In the course of administering the survey, the author observed that the stakeholders were optimistic and said they would gladly take part in the implementation of the new system. According to their responses, the necessary resources exist to invest in new hardware. The results of the survey are provided in the graph on page 29.

Conclusion

According to the author, automating the terminal operations would help develop an in-house solution for all areas of port operations, terminal management, yard planning, cargo handling, container tracking and integrated tallying. Moreover, e-service technology would constitute unique opportunity to transform complex working procedures into easier processes and improve the services provided by the port.

All the activities of the port are performed by port management itself. This provides a reservoir of knowledge that can make the in-house development of the system more fit for the intended objectives, rather than trying to modify a pre-existing system to meet the complex needs of MPL.

Implementing technological framework or replacing existing software with a TOS solution is considered by all as the best approach for automating port activities.

With regard to the availability within the port to deal with the necessary changes, the author noted that the cost of participating in the scheme would be low because the different departments already had Internet access. According to the survey responses, the necessary resources exist.

Considering the findings of the study, the author offered recommendations, including the following:

- A project team with management support, a properly documented work schedule and a focused measurable action plan is required for the implementation of the system;
- The software must be user-friendly, and replicating the existing manual systems is a prerequisite for general acceptance and uptake on the part of the port community in general;
- Staff training to remove the fear of change and to encourage innovative suggestions for future developments and further uses of the system would be a vital implementation necessity;
- Management should approach e-services as a total solution and not, for example, as a group of separate systems, e.g. ERP.

D. NAMIBIA



Successful participants and jury members at the closing ceremony, Walvis Bay, June 2013.

In Namibia, 23 participants from Namibia Ports Authority (Namport), Spanam Shipping Services C.C. and Subsidiary Co., Ocean Liner Services, Costal Imports and Exports, and Trade Ocean Shipping, and the Namibian Navy (Ministry of Defence) were enrolled in the programme (this was the programme's first cycle in Namibia). Eleven successfully defended their dissertations and received the UNCTAD Modern Port Management Certificate.

Five participants chose topics related to human resources management. They chose to look at issues such as further educational opportunities, staff liability and responsibility for decisions and actions, and the need for a succession planning process for key positions. Four participants chose topics that focused on the operations at the port's bulk and break bulk terminals. Specific issues that were looked at included the potential benefits of a port community system, the related issues of container terminal efficiency and the impact of equipment availability on efficiency. Three participants conducted research on issues related to the marine department, such as vessel tracking

systems and international ship and port security. Other participants decided to look into the effectiveness of specific Namport procedures and policies.

Following the presentation and defence of each dissertation, the jury panels deemed the following dissertations to have achieved the highest results. The basis of assessment is a combination of the relevance of the topic, quality of research, accuracy of analysis and pertinence and feasibility of the recommendations.

1. Port Access to Foreign Flagged Fishing Vessels in Namibia, by Pilar Veiga.
2. A Study of the Impact of Equipment Availability on the Operational Efficiency in the Bulk and Break Bulk Terminal at the Port of Walvis Bay, by Bykes Muashekele.
3. An Investigation into Whether the Port of Walvis Bay Infrastructure is Sufficient for the Influx of the Motor Vehicle Industry, by Zane Mouton.

A summary of each dissertation follows.

1. Port access to foreign-flagged fishing vessels in Namibia



Mrs. Pilar Veiga, Manager and Partner, Spanam Shipping Services and Subsidiary Co.¹⁰

Introduction

Over a period of six years, the number of fishing vessel calls has diminished, yet the volume in tonnage terms has remained constant. This indicates an increase in the size of fishing vessels calling at the port. The national importance of the fishing industry can be judged by the fact that Walvis Bay is listed in the top 10 ports in the world in terms of fish landed.

This study set out to address the uncertainty in relation to the freedom for foreign-flagged fishing vessels to choose the berth at which to land their catch. The situation at present requires specific permission from the Port Authority to discharge at a private facility. In advance of every call, the ship agent must request specific permission, which may be denied.

In the event of permission not being granted to discharge at a private facility in the fishing harbour, vessels must work at a common user berth in the commercial harbour, which, in the opinion of the shipowners and cargo owners, is not conducive for the offloading of products for human consumption. The main issues they have concerns about are hygiene, security and ship turnaround time. This is because the berths that are designated for fish discharge are also used for coal, salt and a variety of mineral ore products, such as zinc and sulphur. These products could potentially contaminate the fish. Moreover, these do not respect the quality standards for fish products that are required by recipient countries.

The author set out to examine whether Namibian Ports Authority (Namport) is acting within its remit when permission is denied.

Analysis

In defining a foreign-flagged vessel, the author drew on definitions in the Customs and Excise Act, the Sea Fisheries Act and the Merchant Shipping Act to establish the commonly held view in relation to the operations of these vessels.

The next stage was to establish the legal implications of the structure setting up Namport – the duties and obligations of the Port Authority. The author researched the Namibian Port Authority Act, under which the Port Authority was set up, and described in detail the area of jurisdiction of the Port Authority. In defining this area on a chart, it is clear that the private jetties are outside the land jurisdiction of the port. In fact, they are not shown on the Namport facilities map, nor are they included in the area of planned future development.

The author agreed that Namport must have jurisdiction over the approaches to the commercial harbour and the fisheries berths. She also agreed that the Port Captain should afford access authority based on national legislation and international conventions.

Thereafter, the author set out to examine the impact of the uncertainty of berth operations on various stakeholders: shipowners, ship agents, berth owners, Customs and Excise, the Department of Fisheries and Namport.

According to the report, the shipowners have a preference for Walvis Bay rather than a neighbouring port because of the availability of multilingual ship agents and of mechanical engineering workshops, and the proximity of the town services. Time in port is time lost for vessels on any trade, but the perishable nature of the fish trade, coupled with the strong sunny weather in Namibia, makes the time transfer from a ship's hold to refrigerated containers crucial, as cargo deterioration can result in heavy loss of value. Thus continuous working, even through the night, is of paramount importance. The private berths offer more stability from arrival to departure, as it is unlikely that the vessel will be instructed to shift during discharge operations, which can occur when working in the commercial harbour.

Ship agents must at all times act in the best interest of shipowners – this is a legal obligation. Furthermore, they cannot withhold information from them that could be beneficial to them (even to the point where the ship agent could lose revenue). The

¹⁰ Ms. Veiga's mentor was Ms. Ipupa Kasheeta, Bulk and Break Bulk Manager, Namibian Port Authority.

lack of certainty as to the berth where the ship can work creates a dilemma for the ship agent, as he or she always tries to provide shipowners with the best option. This is further complicated when the ship in question is a fishing vessel, as a fishing vessel with a full load must get into a port to discharge as soon as possible. Faced with an uncertain situation at one port, the vessel captain may decide to land the catch at an alternative port. This could lead to future losses in revenue for the port, as a vessel that transfers to another port for one call may for many reasons decide to continue calling at the other port. A client lost is more difficult to retrieve than to keep existing business, considering the energy, money and time spent in the retrieval process.

Private berth owners have made an investment in their facilities, primarily for the Namibian fishing fleet; notwithstanding, additional revenue from the foreign-flagged fleet is welcome additional income. This is not to suggest that Namport should not compete for the business, but rather that they should do so on a commercial basis and not allow the private berths to do the work only when Namport is too busy with other traffic.

The Customs and Excise Office is in the commercial harbour and their main interest is preventing uncleared goods from entering the country (the fish is loaded into refrigerated containers for shipment from the port), apprehending stowaways before they come ashore and monitoring the use of duty free fuel on fishing vessels. The author conducted extensive research on these matters, examining the Customs and Excise Act of 1998, the Constitution of the Republic of Namibia and the former South African Customs and Excise Law, as well as documents from the World Trade Organization and the General Agreement on Tariffs and Trade, and information on trade-related aspects of intellectual property rights. Based on this research, the author concluded that the onus is on Customs and Excise to ensure that foreign-flagged vessels are treated no less favourably for transit traffic as State-registered vessels plying the same trade. Port authorities are obliged, except in exceptional circumstances, to make the provision of services available in an open and transparent manner.

Another stakeholder is the Department of Fisheries. The inspectors from this regulatory authority must have access to the vessel, regardless of what berth it is at. Their function is to check the daily catch

log book to see where the fish were caught, and verify that no illegally caught fish are on board the vessel. They also examine the catch to ensure that fish deemed unsuitable for human consumption are segregated from the main catch. The required documents for entry, for example into the European Union, are then completed. The inspectors interviewed for this study were quite indifferent as to what berth the vessels were worked at, provided the necessary facilities to enable them to complete their duties were in place.

Namport stated that their position was twofold. Firstly, as a commercial harbour they are not in competition with the fisheries harbour. Secondly, it is their opinion that, as foreign-flagged vessels constitute a safety and security issue and involve Customs and Excise and Immigration Control, these vessels should discharge their catch at the commercial harbour. This raises the question of consistency: If the former is the case, why then does Namport authorize the working of these vessels at private berths when the commercial harbour is full and even when the agent gives a 72-hour notice in writing of a vessel being due? According to the Act setting up Namport, it has a duty to provide facilities and services proper to the functioning of a port, ensure maximum usage and yield a fair and reasonable profit. Access was established in the case of *London and North Eastern Railway Company vs. British Trawlers Federation Limited and Others*. This case placed in question the extent to which the port could exercise their statutory powers and impose restrictions to access.

Tariff charges were then examined, as the tariff charges for imported fish are applied when the fish in question is landed for transit but not imported. The author is of the opinion that the tariff is not properly structured and that incorrect charges are currently levied.

Conclusion

In conclusion, the author stated that Namport meets periodically with the representatives of the fishing industry. When asked about the reluctance to discharge at the commercial harbour, they cited the issues of space, hygiene, European Union Code requirements, poor productivity, and risk to the cold chain.

The author could not find any reference in Namibian Law that designates Namport Commercial Port as the sole point of entry and discharge for foreign-

flagged vessels. Further research could not establish any legislation vesting similar authority in relation to Customs and Excise. A reason given by Namport for the approval requirement is to protect their income stream.

The author raised the issue that by requesting permission to work at a private berth, and only so doing on the basis of ad hoc permission, the industry is investing Namport with authority it was never intended to have. Moreover, the author found that the current policy imposed by Namport could be in contravention of the WTO and GATT Agreement that established freedom of transit.

2. A study of the impact of equipment availability on the operational efficiency in the Bulk and Break Bulk Terminal at the Port of Walvis Bay

Mr. Bykes Muashekele, Mechanical Superintendent, Namibian Port Authority¹¹



Mr. Muashekele receiving his certificate from Mr. Bisey Uirab, CEO, Namport.

Introduction

Around 60 per cent of ships calling at Walvis Bay are container vessels; bulk and break bulk vessels account for 40 per cent. The turnaround time for bulk

vessels is between 24 and 48 hours; for break bulk it is between 18 and 20 hours. Regular calls of Ro-Ro vessels are now contributing to this business, which has brought the importance of the bulk berths into the spotlight.

With the ever-growing importance of equipment availability on operational efficiency, the aspect of sufficient and effective utilization of deployed equipment cannot be overstressed, nor be ignored, as it has a direct impact on the productivity and throughput of the bulk and break bulk terminal.

As the port's equipment is aging at the same time that business is growing, the author deemed it appropriate to examine the impact of equipment availability as an element of operational efficiency.

The problem researched in this study addresses two of the five strategic outcomes of Namport: increasing the throughput and improving the port's efficiency.

The focus of this study was not the turnaround time of vessels at the Break Bulk Terminal (BBT), but rather the consistency and quality of services provided while vessels are on the berth. The author set out to determine if the equipment at BBT is appropriate and sufficient and deployed to ensure operational effectiveness, if the maintenance strategies are conducive to meet operational demands and to establish whether or not equipment operators have the required skills for their job.

Analysis

Primary data were obtained by means of questionnaires and semi-structured interviews, while secondary data were obtained from reports and documents from the various business units. The target audience were those directly involved in the day-to-day management and operations of BBT.

The key areas considered by the study were the type and number of vessels calling at BBT, the terminal's throughput and the availability and utilization of equipment in the terminal.

According to the statistics the author was able to compile, 4,851 vessels were worked at BBT between 2010 and 2012. Container vessels accounted for 36 per cent of the vessels worked. The second and third most important vessels were foreign fishing vessels (13 per cent) and general cargo vessels (11 per cent). All other vessels worked accounted for

¹¹ Mr. Muashekele's mentor was Ms. Ipupa Kasheeta, Bulk and Break Bulk Manager, Namibian Port Authority.

the remaining 9 per cent. It should be noted, however, that 31 per cent of the vessels worked were classified as “other”.

The throughput directly addresses the actual tonnages of cargo handled at the Port of Walvis Bay. The tonnages handled directly represent the operational efficiencies of the port. However, BBT does not have a real-time system that could assist with accounting for the tonnages handled; therefore, time difference have been affecting the reported throughput. Of the total throughput of the port, approximately 59 per cent of the tonnage handled was through BBT.

Equipment reliability must be considered alongside availability, and there are two components to reliability to take into account: mean time to repair (MTTR) and mean time between failures (MTBF). Availability could be unclear if it is not defined in terms of MTBF. The interviews conducted by the author revealed the following:

Challenges highlighted by type of vessel

Ro-Ro ships are time-consuming and labour-intensive. Fishing vessels highlighted unfulfilled expectations due to equipment shortage. When sugar and salt vessels clash with fishing vessels there is insufficient cargo handling equipment; while this affects the cargo of all the vessels, the negative impact on the fishing vessel is greater because of the perishable nature of the cargo.

Quality of service to vessels

Bulk cargo vessels are delayed due to failure of grabs and spreaders. The skills of equipment operators and stevedores are not up to the required standards. Shunting rail wagons with tractor units and front-end loaders are a safety risk.

Equipment availability

The equipment is aging and business is growing; reliable operating equipment is thus required. The wharf cranes and fork lift trucks have passed their useful life. A dedicated mobile harbour crane is needed for the bulk terminal.

Factors effecting performance

There is a lack of commitment and leadership from the quay coordinators and tally clerks. Delays were

experienced while waiting for reach stackers to move refrigerated containers (full of fish) to reefer plug points. This issue also affected the placing of further empty containers for loading. There was damage to equipment due to insufficient manpower with the appropriate training and skills.

Skills and knowledge required

In the bulk area, approximately 67 per cent of operatives require training; in the break bulk area, this is not an issue. In relation to equipment, all operators need training to have a better understanding of the equipment. Staff awareness of operating procedures and equipment maintenance strategy could be improved. In the bulk area, only 67 per cent of those surveyed considered themselves well-informed with regard to the equipment maintenance strategy; by comparison, this question was deemed not applicable in the break bulk area.

Conclusion

Based on the findings of the study, the author believes there is a need to provide additional equipment, for example a mobile harbour crane with various lifting attachments for the Bulk Terminal. But more than additional equipment, what is needed is a streamlined process. A terminal management system should be implemented, and it should provide real-time tonnage handled for bulk vessels and record performance per vessel for handling equipment.

The maintenance system should be subject to annual external audits to remain ISO-compliant. Moreover, a replacement strategy based on life cycle and maintenance should be introduced.

Bulk and break bulk tactical teams should be made aware of equipment maintenance planning. Namport should consider devising a short mechanical appreciation course for all staff involved in bulk and break bulk operations. As English is a barrier for some staff, Namport should also consider offering an operator’s handbook in Oshiwambo and Afrikaans.

Equipment availability should be subject to utilization analysis to establish required numbers. Planning of salt and sugar vessels should be prioritized in to avoid delays.

3. An investigation into whether the Port of Walvis Bay infrastructure is sufficient for the influx of the motor vehicle industry



Mr. Mouton receiving his certificate from Mr. Bisey Uirab, CEO, Nampol

Mr. Zane Mouton, Agent, Coastal Imports and Exports¹²

Introduction

In the past four years, Walvis Bay has experienced a significant increase in the volume of Ro-Ro vessels calling at the port with motor vehicles for transit to Land Locked Countries (LLC). In 2009 there were eight Ro-Ro vessels that brought in a total of 362 vehicles. By 2012, the number of vessels had increased to 54 (one per week), with a total of 12,983 vehicles.

In particular, the Trans Kalahari Corridor, which connects Walvis Bay with Botswana, South Africa and Zimbabwe, has shown an increase of traffic of 115 per cent. The Ndola Lubumbashi Corridor, connecting Walvis Bay with the Democratic Republic of the Congo and Zambia, has recorded an increase of traffic of 75 per cent. The Trans Cunene Corridor, which connects Walvis Bay with Angola, recorded an increase of traffic of 29 per cent.

¹² Mr. Mouton's mentor was Ms. Ipupa Kasheeta, Bulk and Break Bulk Manager, Namibian Port Authority.

A Walvis Bay Corridor Group (WBCG) report, dated 4 February 2013, indicated that in 2012 more than 20,000 vehicles moved via the Corridor Routes to Angola, Botswana, the Democratic Republic of the Congo, Malawi, Mozambique, Zambia and Zimbabwe, with an estimated contribution of N\$150 million to the Namibian economy. According to the report, this represented a 100 per cent increase on the previous year.

This dissertation examined the capacity and structures currently available, as well as those needed in the future, to handle this growing business. In particular, it examined ship turnaround times, customs clearance, safety, security, land availability for storage, and infrastructure, including national roads.

Analysis

A questionnaire was designed and the author conducted a survey of the 10 local agents involved in the transit vehicle trade. Of those surveyed, 80 per cent did clearance of transit vehicles on a daily basis, while the remaining 20 per cent did this on a weekly basis.

On arrival at Walvis Bay, a vessel is attended by various agencies – Customs, Immigration and the Namibian Police Force (Nampol) – each with their own security interests.

When asked to rank the sources of most delays, 80 per cent of the respondents cited Customs, 40 per cent listed police clearance and 30 per cent identified the application requirements for permits. The results were the same when they were asked where improvement was most needed.

In response to the reliability of the security guards in the port and their willingness to help, the survey population was divided. In relation to security of vehicles at the port, 70 per cent indicated that they did not deem them secure, while 30 per cent were pleased with the security of the vehicles. Regarding the management of the port exit gate, 40 per cent of the respondents deemed that it was poor, 30 per cent considered it to be fair and another 30 per cent said that it was very good.

The author also conducted an interview with the Head of Protection Services, Mr. Titus Tsoわせeb. According to Mr. Tsoわせeb, it is now the policy of the port to take control of all security operations, some of which had previously been provided by private contractors. It is proposed to deploy modern security technology and

to appoint experienced, skilled and trained individuals to operate the system and strengthen the present security management function. It is his opinion that while the port experienced security challenges, it had not experienced pilferage on a scale that would raise a security issue. Namport currently has a security staff of 18, to which they expect to add an additional 54 at the commencement of the port expansion project. In addition, 89 subcontracted security guards work on site. Security is provided 24 hours per day, seven days per week, on the basis of a three-shift arrangement. There is also a CCTV system in operation and a security procedure for various areas, both of which are subject to compliance audits at regular intervals.

The introduction of a port electronic access control system is planned. The system will be structured in such a manner as to allow staff access to areas in relation to their work profile requirements.

To examine what has occurred at other ports, the author researched how the same traffic was handled at the Port of Durban. The Port of Durban was chosen because in 1996 it was where Walvis Bay is now in terms of volume, and it had similar projections for future expansion and growth.

The Port of Durban handled two thirds of the car imports and exports of South Africa. It has a dedicated Ro-Ro quarter ramp car terminal with excellent infrastructure and facilities, i.e. three-level car parks with a capacity for 1,000 vehicles on each level, ground car parks with a capacity for 3,500 vehicles, high mast floodlighting, high security fencing, CCTV and a rail connection. The provision of a bridge from the quayside to the car parking areas has reduced the risk of accidents and the need for security. More important, the bridge has contributed to the vehicle discharge rate, which has increased from 100 to 170 vehicles per hour.

The Durban Car Terminal employs a staff of 50 to carry out the discharge and loading of these vessels. The Port of Durban has a terminal management system that provides real-time tracking of vehicles during discharge and loading. This system adds value when vehicles are being collected for delivery or retrieved for shipping.

Conclusion

According to the author, Walvis Bay has the capacity to handle the current volume of transit traffic. However, handling existing volumes more efficiently could enable greater volumes to be handled with the existing facilities. The author offered the following recommendations:

- Coordination of Customs, Namport Security, Nampol, and Terminal Management is vital;
- Coordination and Cooperation of Customs, Namport and the Namibian Roads Authority should be improved;
- Implementation of an electronic terminal management system is required for the efficient discharge, location and retrieval of units from the parking area;
- Namport should review the current CCTV and security system at the port to determine whether an upgrade is needed;
- Training is needed to ensure that Namport security services are implemented in a manner that is responsive to customer needs;
- Police and permit formalities should be completed inside the port area;
- Quay office opening hours should be extended to 6 p.m.

E. UNITED REPUBLIC OF TANZANIA



Participants during a port visit, Dar es Salaam Port.

In the United Republic of Tanzania, 25 participants from the Tanzania Ports Authority (TPA) and Tanzania International Container Terminal Services were enrolled in the second cycle of the programme. Fifteen participants successfully defended their dissertations and received the UNCTAD Modern Port Management Certificate, including one participant from the previous cycle.

Five participants chose topics that related to port congestion and possible measures that could help resolve the issue, as well as the role of Dar es Salaam Port in the economies of landlocked countries. Three participants focused on the impact of crane allocation on ship turnaround time and the effectiveness of dwell time on port operations. Two participants decided to look at the impact of terminal leasing/privatization and the introduction of ICD and CFS operations on port operations. Other participants looked at a range of different issues, including quality and added value services at the port.

Following the presentation and defence of each dissertation, the jury panels deemed the following dissertations to have achieved the highest results. The basis of assessment is a combination of the relevance of the topic, quality of research, accuracy of analysis and pertinence and feasibility of the recommendations.

4. The Effect of Crane Allocation on Ship Turnaround Time: Empirical Evidence from Dar es Salaam Port, by Mr. Makiri M.F. Ngangaji.
5. The Effectiveness of Dwell Time Reduction Measures in Dar es Salaam Port, by Ms. Amina A.R. Makoko.
6. Introduction of Privately Owned Inland Clearance Depots as a Means to Decongest Dar es Salaam Port, by Mr. Julius R. Mitinje.

A summary of each dissertation follows.

1. The effect of crane allocation ship turnaround time: Empirical evidence from Dar es Salaam Port



Mr. Makiri Ngangaji, Principal Business Development Officer, Tanzania Ports Authority¹³

Introduction

Overall, 90 per cent of international cargo moves through seaports. And 80 per cent of all international cargo travels in containers. It is therefore imperative that ports manage their container operations effectively and efficiently.

National industries are exposed to the pressures of international competition. As the level of port efficiency and performance can have an impact on a nation's international competitiveness, ports face constant pressure to improve efficiency and performance of the services provided, in the effort to lower the overall costs of their operations. Ship operators and freight forwarders consider ship turnaround time to be a crucial indicator of port performance.

Shorter ship turnaround times would translate into lower input costs to suppliers and producers, which would result in lower prices for customers. This highlights the significance of port efficiency and performance to any national economy. Therefore, it is important for port management to understand the factors that influence ship turnaround time.

The topic was chosen and the study conducted because of the rapid development in container operations at Dar es Salaam, and because there were few studies that had quantified the relative contributions of various factors underlying performance.

With regard to ship turnaround time, the author focused on the deployment of assets, labour and, in particular, machinery. The dissertation aimed to demonstrate empirically how a more effective allocation of machinery (cranes, in particular) could improve cargo handling, and how this, in turn, would

ultimately result in costs savings to the port and ship operator.

Analysis

To compare and contrast performance, a process must be put in place to measure achievements against a set of goals and objectives. When measuring performance, it is vital that targets be set and that they be subject to continuous monitoring.

The data used were taken from the daily ship reports supplied by Tanzania International Container Terminal Services Limited. The study also used data from Dar es Salaam Port for the period July 2011 to June 2012. The author used econometric methodology of co-integration analysis to develop and test an empirical ship turnaround model.

The model used to determine turnaround time – Augmented Dickey-Fuller – included all machinery deployed in the operation: ship-to-shore cranes, mobile harbour cranes, trucks, trailers, straddle carriers, rubber tyre gantry cranes, reach stackers, high stackers, empty stackers and front-end loaders. This is because they all contribute, to a greater or lesser extent, to the overall standard of service provided.

The study developed a series of mathematical calculations based on all the variables applicable to the different elements in the operation.

In testing the ship turnaround model developed in the dissertation, the author arrived at the following conclusions:

- Increasing the ship-to-shore crane allocation by one unit would reduce ship working hours at a berth by 9.4 hours;
- Increasing the number of units for discharge by unit would increase the ship working by 1.5 minutes;
- Increasing the number of containers loaded by one unit would increase the ship working hours by 3 minutes.

These findings underscored that equipment purchasing policies and procedures were technical management aspects that the Port Authority must not overlook. Decisions on whether or not to buy new equipment (i.e. quay cranes), or when and what amount to buy, must be made based on the forecasted volume of cargo and traffic flows, data on equipment productivity and performance objectives. Therefore,

¹³ Mr. Ngangaji's mentor was Mr. John Kingu, Assistant Lecturer in Economics, Institute of Finance management, Dar es Salaam.

it is necessary that adequate resources (financial, human and time) be allocated to gathering data and statistics on equipment productivity so that the Port Authority can make well-informed decisions.

The study determined that the components that contribute to the overall turnaround time in any port are a combination of the following:

- Waiting time at the outer anchorage;
- Inward pilotage time;
- Time at berth;
- Outward pilotage time.

Time at the berth can then be further subdivided into the following:

- The time from the first line ashore to when the vessel is ready to commence discharge;
- The time from the commencement of discharge to its completion;
- The time from the commencement of loading to its completion;
- The time attributable to delays due to weather, cargo availability for loading and equipment failure;
- The time from the loading of the last unit of cargo until the last shoreline is let go.

Conclusion

The decision to purchase new equipment lies with the port or the company providing cargo-handling services. With the constant change in circumstances and demand, and the rapid obsolescence rate of equipment, purchasing decisions have become an even greater risk to operating companies. Port equipment must be adjusted to meet increases in traffic flow; however, because of the long delay in procurement processes, forecasting of expected volumes must be accurate and reliable well in advance.

Shipowners, operators, cargo owners and transport operators are all looking to ports to provide faster turnaround times. It can be seen that this involves a multiple of service providers, all with different and sometimes conflicting requirements. Ports, by their very nature, need to have a policy regarding equipment purchasing and renewal that will not only keep their standards in line with competitors, but also enable them to meet customers' needs and expectations.

Time at berth is an important determinant of the overall turnaround time in any port. To reduce vessel time at

berth, terminal management should focus on reducing the time from the commencement of discharge to its completion, the time from the commencement of loading to its completion, and the time from the loading of the last unit of cargo until the last shoreline is let go. This is because the other aspects of vessel time at berth are outside terminal operations control. The three cycles can be monitored in relation to crane and ancillary equipment allocation and utilization.

2. The effectiveness of dwell time reduction measures in Dar es Salaam Port



Mrs. Amina A. R. Makoko, Audit Manager, Tanzania Ports Authority¹⁴

Introduction

Dwell time is an instrument used to measure the handling efficiency of a terminal. This becomes more critical when the destination is a landlocked country (LLC) because, in general, half of the overall transit time is spent in the port of arrival.

In an attempt to reduce dwell times in African ports, the international community has focused on improving customs clearance, State agencies and logistics because the belief has been that that these were responsible for much of the delays. Less attention was given to improving infrastructure.

To improve cargo dwell time at Dar es Salaam Port, Tanzania Ports Authority (TPA) introduced certain measures, including the decision to raise charges after seven days for domestic cargo and 21 days for cargo whose destination was an LLC. Despite these measures, high dwell times are still hampering the port's performance.

The study sought, therefore, to assess the effectiveness of different dwell time reduction measures introduced by TPA, and to recommend other actions that could improve dwell time in Dar es Salaam Port.

¹⁴ Ms. Makoko's mentor was Mr. Nelson Mlali, Principal Research Officer, Tanzania Ports Authority.

Analysis

The author reviewed reports on cargo dwell time in ports by the National Academy of Sciences in the United States of America, and numerous research papers.

The author also examined the case of the Durban Container Terminal in the Port of Durban (South Africa), where in the past particular attention was given to reducing port dwell time. Transshipment dwell time in the port is between 5 to 10 days with some irregular peaks of 15 days. In general most cargo moves in 4 days. Information provided by shipping lines indicated that 10 per cent of containers remained on quay for more than 3 days; less than 1 per cent goes beyond 28 days. Durban, therefore, seems to be a good benchmark. Indeed, with regard to cargo dwell time, it is the lowest in South Africa and sub-Saharan Africa.

Dwell time reductions in Durban were achieved by introducing a combination of tariff changes and customs modernization. Durban sought to set tariff charges that would discourage the use of the port as cheap warehousing, while at the same time being realistic, considering the time needed to process customs clearance.

It was calculated that reducing dwell time from 11 days to 5 days could increase the container terminal capacity by 118 per cent. Likewise, reducing dwell time from 5 days to 3 days could release an additional 53 per cent of terminal capacity.

The Port of Durban also put in place a number of policies to encourage the removal of goods. Some of the measures introduced included publishing cargo arrival times, expiry times for free storage, and sending SMS messages to encourage the collection of goods. Likewise, the port introduced incentives for clearing and collecting cargo early by offering preferential slots for collections.

The author believed that important lessons could be learned from the experience in Durban, and that it could serve as a blueprint and benchmark for all ports in sub-Saharan Africa, including Dar es Salaam Port.

The study population was all the TPA stakeholders: ship agents, clearing agents, freight forwarders, private inland clearance depots, container freight stations, surveyors, the Tanzania Revenue Authority (TRA), Tanzania International Container Terminal Services

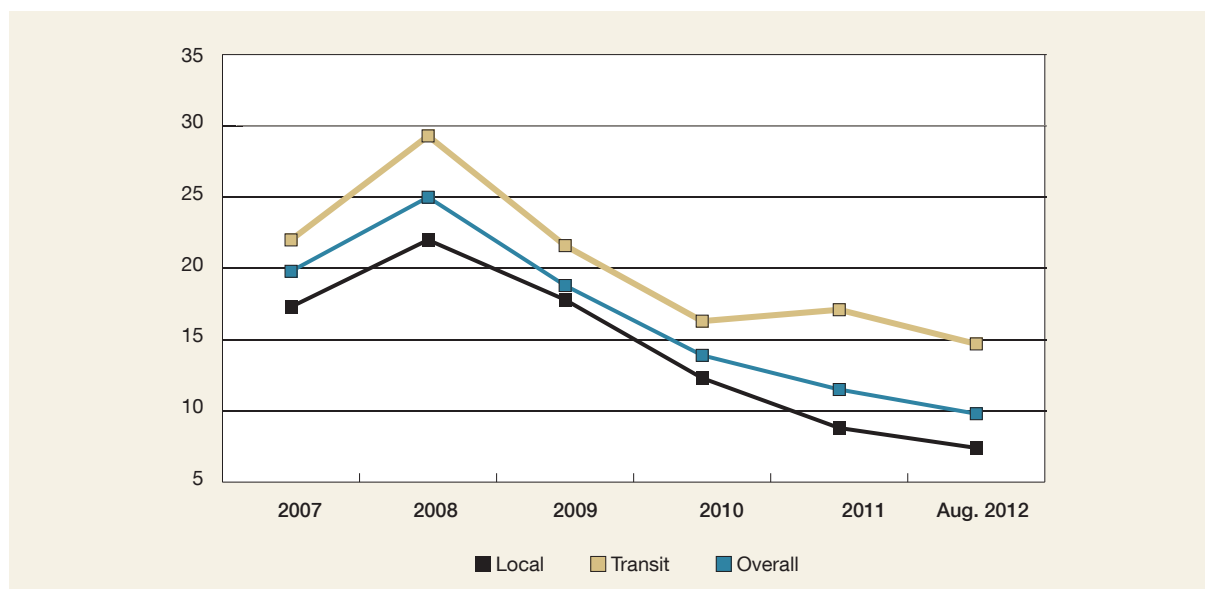
Limited (TICTS), TPA employees and Government departments. The size of the study sample was 71 persons. This included port officials, road transport operators, truck drivers, railway officials and individuals from Government agencies. Data were collected through structured interviews and observations. Secondary data were collected through TICTS, TPA and TRA reports, as well as other scholarly articles. Seventy-one questionnaires were distributed, 43 of which were fully completed (this constitutes a 60 per cent response rate).

Between 2000 and 2008, volume in Dar es Salaam Port consistently increased and in 2006 throughput surpassed the design capacity of the port. During that period, ships waited up to 12 days for a berth, container dwell time was about 25 days and longer transit times were the norm.

Consequently, Dar es Salaam Port undertook a series of measures that resulted in a reduction in dwell times. These included cargo clearance procedures, the implementation of a port community system, cargo systems, cargo dues and the provision of a one-stop-shop centre to reduce the number of formalities for clearing and billing. In addition, Dar es Salaam Port has been implementing a terminal management system that has reduced manual labour. This has reduced clearance time, which in turn has helped reduce dwell time. Finally, a process is now under way to integrate all the port and terminal systems to facilitate use by port staff, stakeholders and State agencies. The graph below shows the reduction in dwell time from 2007 to 2012. This data would indicate that the measures implemented by TPA have had a positive impact on the dwell time of full import containers. However, the emphasis must now centre on implementation in order to reduce the local traffic to four days and transit traffic to seven days.

In view of the comments by the majority of respondents in relation to the customs clearance process, the researcher looked into each step of the process. The time taken from arrival to removal of goods, including the administration and the cargo-clearing process, was found to be 11 days. The author, therefore, concluded that any efforts to process documentation with customs prior to vessel arrival that enables more speedy clearance procedures would have a positive impact on dwell time. The time taken from the release of goods to their removal is three days. This issue must be addressed by TPA as it lies within its direct remit and control.

Full import container dwell time (2007–August 2012)



Source: Ms. Makoko's final dissertation.

Conclusion

Physical capacity is a critical issue for ports, but it is all too easy to embark on a capacity extension project without exploring more optimal use of existing capacity. Dwell time can be a more efficient way to release additional capacity in a container terminal at limited cost.

The study determined that the measures introduced by Dar es Salaam to reduce dwell time have been effective. According to the data collected, ship-to-shore handling is up to international norms but on-shore handling is more than twice international standards.

Considering the findings, the author proposed the following recommendations:

- TPA should consider a rollout of a customs computerized system to other customs points in order to streamline processes and remove the many blocks that delay cargo destined for LLCs;
- TPA should discourage free storage and should consider reducing the free time for domestic containers from seven days to three days;
- TPA should consider implementing a container tracking system and concentrating the container holding area to land adjacent to container berths, in order to facilitate greater equipment utilization and improve

the interaction of all parties involved in cargo handling;

- It is necessary to replace the necessity to carry out a physical check of all units by implementing a process that does not require the physical check yet enables customs to fulfil the requirements and protect the State's interest.

3. Introduction of privately owned inland clearance depots as a means to decongest Dar es Salaam Port



Mr. Julius R Mitinje, Principal Business Development Officer, Tanzania Ports Authority¹⁵

Introduction

With increasing volumes and congestion, ports are looking to dry ports or inland clearance depots (ICDs) as a capacity enhancement strategy. In 2009, six such depots were introduced to decongest Dar es Salaam's container terminal.

¹⁵ Mr. Mitinje's mentor was Mr. Nelson Mlali, Principal Research Officer, Tanzania Ports Authority.

A dry port is an inland terminal, directly connected to a seaport terminal. Depending on the specific needs of the port, these could be located in close proximity to the port itself, or up to 1,000 kilometres from the port. As this type of operation could increase the overall transport cost for the cargo, there is a need for sound economic planning before setting up an ICD. The facility must be viable from a management perspective and attractive to users, to the railways (full trainload movements), and to other transport operators, shipping lines and freight forwarders.

The features associated with a port container terminal will be replicated at the ICD, thus in order to provide a payback for the providers, the ICD would need to be capable of dealing with projected increases in traffic over the next 10 years.

The study set out to assess capacity in relation to the utilization of the existing ICD, and to assess the transfer operations from the port to the ICD to see if they support the decongestion strategy.

Analysis

For his literature review, the author examined numerous publications on the subject of ICDs and port congestion. The high volume of recent publications on the subject served to demonstrate the worldwide attention directed at ICDs as a means of addressing port congestion.

The articles highlighted the potential benefits of operating a dry port or ICD, including: increased trade flow, expanded seaport capacity, reduction in total transportation costs, increased government revenue, quicker clearance and release of goods.

Subsequently, the researcher examined the elements involved in the process. With regard to the transfer from the seaport to the ICDs, he established that the plan in Dar es Salaam Port called for the movement of 250 units per day; however, the actual figures (averages) for the years reviewed, including turnaround time, are shown in the following table.

Year	Units	Turnaround time (hours)
2009	117	
2010	157	3.2
2011	214	2.9
2012	201	3.3

Source: Mr. Mitinje's final dissertation..

The author established the following as the main reasons for the shortfall and delays:

- Delays at the scanner – all units leaving the port for an ICD must be scanned;
- Congestion at exit gate number five, which handles all import and export cargo;
- Lack of container handling equipment, specifically rubber tyre gantry cranes and reach stackers;
- Road traffic congestion leading to and from the port;
- Availability of road transport to move units allocated and booked for transfer;
- Container tracking at the seaport – inability to locate containers;
- Space limitations at the ICDs.

The researcher turned his attention to the key performance indicators at the terminal operated by Tanzania International Container Terminal Services Limited for the same period to study the impact of the ICDs on terminal performance. Between 2008 and 2011, volume increased by over 100,000 TEU. During the same period, ship turnaround time fell from 10.5 days to 6.5 days. Ship wait time also decreased, from 7.2 days to 3.4 days. And crane productivity increased by 49 per cent.

Based on these figures, the author deemed that the introduction of ICDs had led to improvements in port operations and capacity. The author posited that without ICDs the seaport would have experienced higher levels of congestion.

With regard to the utilization of the ICDs, the data collected indicated that these were operating between 40 per cent and 72 per cent capacity. This indicates that the ICDs are being underutilized. Collectively, the six ICDs have the capacity to handle 11,500 TEU, which would be adequate to accommodate the growing container traffic. Thus, in the long term, the existing ICDs capacity would be insufficient for the longer-term projected traffic.

Conclusion

Research in this study has established that the introduction of ICDs had a positive impact on the productivity of Dar es Salaam Port. In contrast, the capacities of the six ICDs introduced to decongest Dar es Salaam's container terminal are utilized between 40 and 70 per cent. This does not give great scope for development and if this is not improved, the ICDs will

not allow Dar es Salaam Port to meet the long-term requirements for throughput capacity.

According to the author, there were problems associated with the transfer of units from the terminal to the ICD. These included port gate congestion, problems with the scanner operated by the Tanzania Revenue Authority, road traffic congestion and yard operation inefficiencies at the port and at the ICD. It is the author's view that since these ICDs are only handling around 50 per cent of the imported containers landed at Dar es Salaam Port, they will not be a long-term solution for the congestion issue.

Based on these findings, the author proposed the following recommendations:

- TPA should reviewing customs clearance procedures at the seaport, with a view to simplifying the transfer of units from the seaport to ICDs;
- TPA should consider activating a second scanner for traffic going to ICDs;
- TPA should review gate access procedures in and out of the port for transport servicing ICDs;
- TPA should examine the possibility of continuously (24 hours per day) transferring the units heading to ICDs.

